

# THE POLAR TIMES



July 2008



## President's Letter

In May, the polar bear was grudgingly designated as a threatened species by the U. S. Government under the Endangered Species Act, because of summer shrinking of Arctic sea ice. As the *New York Times* pointed out on May 18, this is a victory for conservationists and Interior Department scientists. Dirk Kempthorne, Secretary of Interior, said that the decision was driven by overwhelming scientific evidence that "sea ice is vital to polar bears' survival," and "all available scientific models show that the rapid loss of ice will continue."

The bears use sea ice as a platform to hunt seals and as a pathway to the Arctic coasts where they den. The *New York Times* story pointed out that "the science on polar bears in a warming climate is nuanced. ... Over all, scientists agree that rising temperatures will reduce Arctic ice and stress polar bears, which prefer seals they hunt on the floes. But few foresee the species vanishing entirely for a century and likely longer." Nonetheless, the polar bear is one of the "charismatic megafauna" and as such has captured the imagination and concern of the public. This is no doubt one of the reasons the decision to list the bear under the Endangered Species Act was so bitterly fought by and within the Administration and by the petroleum industry. Although there are roughly 190,000 walrus in the Arctic, researchers have little doubt that the figure is on a downward slide as the polar ice retreats, according to a *New York Times* article on May 20. "The ice is melting three weeks earlier in the spring and re-forming a month later in the fall," according to researcher Carlton Ray of the University of Virginia.

At the "New Generation of Polar Researchers (NGPR)" symposium in May, David Carlson, director of the International Program Office for the International Polar Year (IPY), showed April 24 satellite images of the Arctic Ocean (about the maximum sea ice cover for the 2007-2008 winter) and indicated the very limited thickness of new ice after the record low ice extent of the 2007 summer. Carlson pointed out that there is a several years' supply of warm water in the north Atlantic, which will only result in further shrinkage of sea ice in as it circulates into the Arctic Ocean in the coming summers.

Sea surface temperatures over the Chukchi and East Siberian seas have increased markedly since the year 2000. Recently, scientists from the University of Colorado raised the question, "Could the summer of 2007 be remembered as the first year of a rapid shift to a seasonally ice free Arctic Ocean?", which might be realized as early as 2030 (Strove et al. 2008, *EOS Transactions of the American Geophysical Union*, v. 89, 2, p. 13-14). They stated in their January report, that the large summer heat gains in 2007 are likely to be expressed as thinner than normal ice at the start of the 2008 melt season," (as has since been observed) "and further speculated that "a seasonally ice-free Arctic Ocean might be realized as early as 2030."

Amy Breen reported at the NGPR Symposium, that there were 40% more shrubs in the Arctic tundra than in 1947. At the other

end of the earth, Michael Willis reported, also at NGPR, after making refined corrections based on precise GPS measurements, more than 50% greater ice mass loss from the West Antarctic Ice Sheet than had been previously calculated from the GRACE Satellite over the past several years.

The effects of human caused increase in CO<sub>2</sub> and other greenhouse gasses are becoming ever more apparent, particularly in the Polar Regions. As Susan Solomon (co-chair of IPCC Working group I) and Martin Manning pointed out in a March editorial in *Science*, "the IPCC assessments of climate change science, impacts, and mitigation address one of the most far-reaching and complex challenges that society has ever faced." We in the American Polar Society are well placed to observe these changes and speak our concerns to the public, where appropriate. Seek out the small active groups in your local areas, who are concerned about climate change and its effects. Some of us (e.g. ... Kenneth Toovak Sr. and I) are old enough to have seen significant changes in the polar regions in our lifetimes. We are in for an exciting ride!

John Behrendt  
APS President

## Secretary's Letter

A very long awaited transition has occurred for me and my family. I was offered a position in our Fairbanks, Alaska office, and we joyfully moved up last month. I lived here for a long time a decade ago before embarking on my "southern" ice experiences, and I am glad to find that the Golden Heart City has changed very little. The boreal forest, permafrost, the low angle sun... I only hope the winters are still as cold and snowy as I remember them to be.

If there are any special requests for stories or other interesting information that I can help with, please let me know. I look forward to working with our Arctic editors if there are any items that I can be of assistance with in that realm. Enjoy this issue of PT!

Kevin Bjella, Secretary

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## About Our Front Cover

Photograph by Karin Lundstrom — Melanism, or abnormally dark plumage, is caused by an increase in the amount of eumelanin present in the feathers. It has been observed in Adélie, chinstrap, gentoo, king, macaroni and royal penguins. Ornithologist-author Frank Todd has photographed a partially-melanistic emperor penguin with a chick. Melanism appears to be exceedingly rare in penguins, with only a few examples ever seen in any species.

This highly unusual chinstrap was photographed at Deception Island's Baily Head rookery on 12 January 2008 at 1815 local time during a visit by the 48 passengers aboard *Professor Mullanovskiy*, operated by Quark Expeditions. The penguin was standing in a shallow pond behind the beach and proceeded inland toward the large 'amphitheatre' rookery.

Remarkably, a melanistic chinstrap—almost certainly the same bird—was seen on 11 January 2008 at 1100 at Half Moon Island, some 75km away, by shipboard ornithologist Chris Wilson and passengers aboard *Spirit of Adventure*, operated by Saga Shipping. Wilson said that the melanistic bird's presence seemed to disturb nearby penguins: "The other penguins really appeared not to like it at all."

Much more common than melanism is leucism, also called isabellinism. It is a form of partial albinism, where a uniform lightening of pigmentation results in a greyish-yellow or beige coloration instead of black. Leucism is caused by a genetic inability to produce melanin. S.C. Forrest and R. Naveen estimated in 2000 (*Waterbirds* 23: 283-285) that leucism occurs in penguins of the Antarctic Peninsula at a rate of about 1 in 20,000 in gentoos, 1 in 114,000 in Adélies, and 1 in 146,000 in chinstraps.

The Australian Antarctic Division's website has several pages of photographs of "unusual penguins" (<http://www.aad.gov.au/default.asp?casid=1693>) including melanistic and leucistic penguins, a mixed species (chinstrap and Adélie) breeding pair photographed at Palmer Station by Chris Denker and Heidi Geisz, and a mottled king penguin seen at Gold Harbour, South Georgia in December 1998 by Rod Eime that somewhat resembles a Dalmation dog. □

Jeff Rubin.

## American Polar Society

The American Polar Society was founded Nov. 29, 1934, to band together all persons interested in polar exploration. Membership dues are \$15 a year (\$17, foreign) and entitle members to receive *The Polar Times* twice a year. The American Polar Society is classified as a tax exempt organization under Sec 501(C)(3) of the IRS Code. For more information about the American Polar Society, contact Kevin L. Bjella, APS Secretary, at 1.802.295.6881 or send email to kevin.bjella@erdc.usace.army.mil.

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# Bergs of a Different Stripe

## ***Beautiful bergs ... but are they bogus or real?***

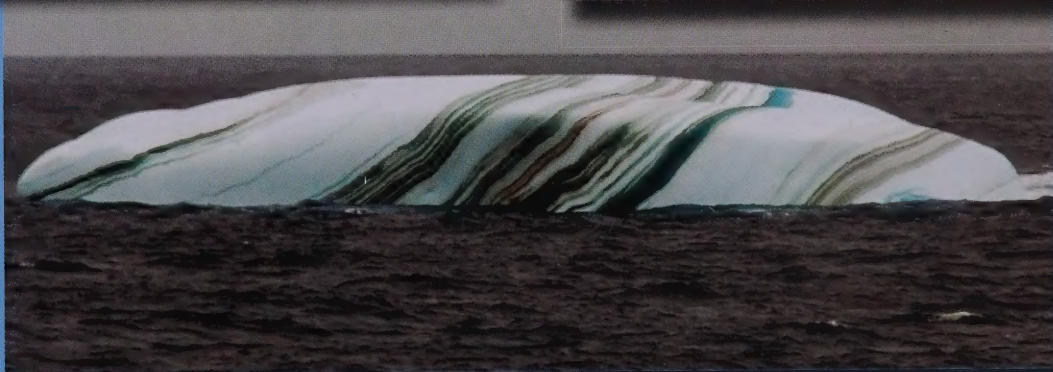
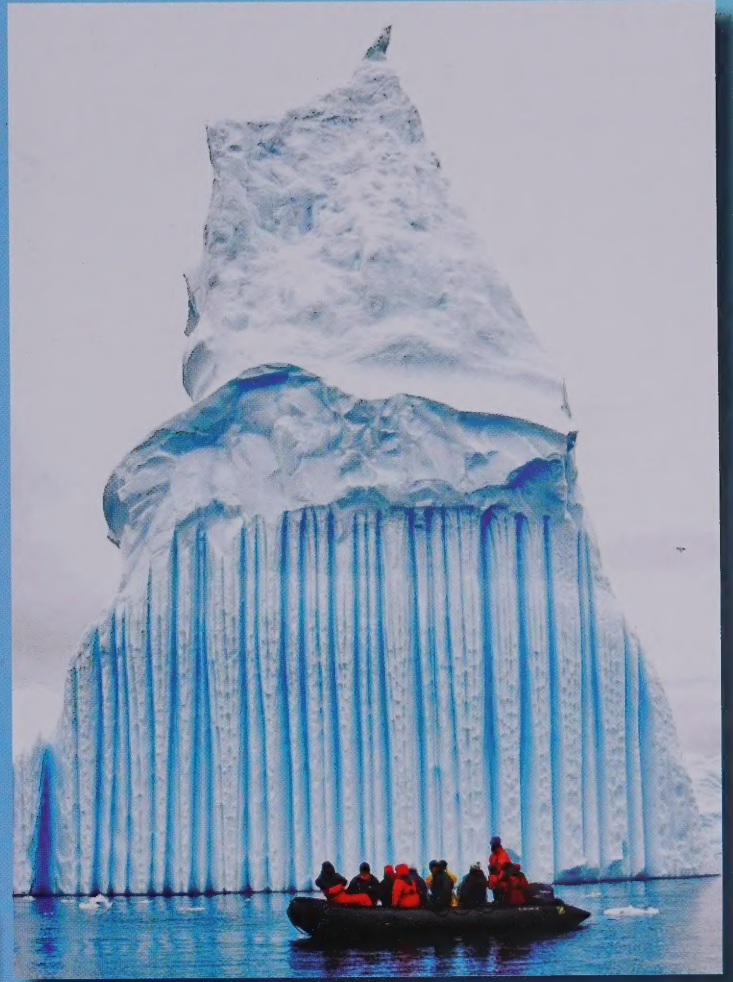
Hopefully, the latter.

The photos on this page are making the rounds on the Internet. Purportedly, they were taken by a Norwegian sailor or sometime last year. The Polar Times tracked a couple of sources to determine their authenticity and hopefully gain permission to reprint. But alas, all leads came to a dead end.

Our resident cynic suggests that these striations might be something other than they appear. He reminded us that it is a documented fact that Norwegian sailors, after long months at sea, invariably make a bee line for photo shops or Kodak kiosks as soon as their ships are tied up, often staying there until all their Kroners have disappeared. If such reports are true – if this is, indeed, how Norwegian sailors spend their shore leave time – then there is a possibility that these might be doctored bergs!

But we'd really like to think otherwise.

So, a question for all *The Polar Times* readers: Have you ever encountered such dramatically striped ice formations? Or—even better—can you lead us to the photographer of these photos (so that we can give proper credit) or to sources that might authenticate them? — Editor □





# Antarctic Mud Yields Climate Change Insight

**Christian Science Monitor, McMURDO STATION, 20 February 2008, by Douglas Fox**—Inside the 24-hour stratigraphy lab, a nondescript metal building perched on stilts, geologists from around the world indulge their collective love of petrified mud. Two shifts of scientists work around the clock examining a 4-inch-wide column of stone. A new section is delivered daily from a drill that, by the end of the season, will have penetrated three-quarters of a mile into the ocean bed.

This stone began as mud that settled on the ocean floor and curdled over eons into rock. From it, the scientists are reading geologic tea leaves between 14 million and 19 million years old: fossils and chemical signatures that provide a record of past climates—and show how Antarctica's ice sheets responded to climate swings.

In doing so, they hope to predict how well Antarctica's ice will withstand rising temperatures in the century to come.

The two crews of scientists converge at 8:30 each morning: One has worked all night beneath the hum of fluorescent lights, and the other has just risen to pick up where the vampires left off.

Their one-hour meeting consists of a slide show of discoveries made overnight—worms petrified in million-year death throes, fossilized sea-shells, microscopic diatoms, and bits of gravel—all suspended in the core.

The slide show is lively, punctuated by questions and murmurs of surprise. "Here is something very weird," announces one presenter, "a bryozoan having some sort of affair with a foram." He points out two tiny fossils caught for eternity in a compromising interspecies pose. A nerdy joke—but the audience likes it.

After seeing slides, the crowd pours down the hallway for another daily ritual—the "land grab." They browse over tables where sections of last night's core lay end to end. Anywhere the gawkers find something they want to study in detail, they jam a toothpick with a paper flag into the cardboard case that cradles the core. The flags carry labels to identify the owners.

Technicians will saw apart the core and deliver pieces to those who staked a claim.

The process repeats daily for eight weeks during the Antarctic summer. Each day offers surprises—and monotony. Science, like the seafloor, is sedimentary.

Those fossils and diatoms aren't breakthroughs in themselves, but patient study of them gradually reveals a picture of the past.

A similar core drilled last year has already revealed surprises: the Ross Ice Shelf has responded strongly to past climate shifts.

"We saw something like 50 cycles [in a few million years] of the Ross Ice Shelf disappearing and coming back," says Fabio

*...worms petrified in million-year death throes, fossilized sea-shells, microscopic diatoms, and bits of gravel—all suspended in the core....*

Florindo, a soft-spoken geologist from the National Institute of Geophysics and Volcanology in Rome. He oversees work here, part of the Antarctic Drilling Project (ANDRILL), along with David Harwood, a micropaleontologist from the University of Nebraska in Lincoln.

The team must rush to finish its work. Fifteen miles from McMurdo, the drill rig rumbles atop 28 feet of floating ice. Its shaft churns through the ice and then 1,300 feet of seawater below to reach the seabed, where it gradually chews a 3,600-foot hole. Drillers must extract that entire section of core within eight weeks—while the weather is warm enough for outdoor work, but before summer temperatures make the ice too slushy to support the 40-ton drill rig.

The drill turns 24/7, as do the two shifts of geologists analyzing each day's



ANDRILL researchers stake claim to interesting sections of newly-drilled sediment cores, delivered by helo to McMurdo each night.

core, 90 feet of which is delivered by helicopter at 10 p.m.

At 2 a.m. sunlight streams horizontally through the windows of the core lab. Christopher Fielding, the University of Nebraska geologist who heads the vampire shift here, motions toward a section of core that alternates paper-thin layers of gray and white stone—layers of mud that solidified long ago. "We've had a lot of nice things to look at," he says, "but this is particularly nice."

When these mud layers formed, Antarctica must have had less ice than it does now—otherwise such delicate layers would have been scrambled by the piles of stones that coastal glaciers dump into the sea. They represent only a short chapter—a few thousand years out of millions—but they're sure to provoke "a feeding frenzy" in the morning, says Dr. Fielding, as people debate how to study them further.

One table over, another section of tonight's core traverses a different period of history. Pebbles lay suspended like chunks of fruit in a Jell-O salad, trapped in the gray background of the core exactly where they fell into the mud millions of years ago.

Sonia Sandroni, from the University of Siena in Italy, leans over the table like a student taking an exam, drawing each stone on a pad of paper with a handful of colored pencils.

"Every single stone is recorded in color," says Fielding. "She's up to about 60,000 so far."

The color Dr. Sandroni chooses for each pebble signifies the type of rock: red for granite, blue for sandstone, white for pumice, and so on. These rocks trav-



eled to the ocean inside glaciers and icebergs, and by matching them to rocks in different parts of present-day Antarctica, she can tell where the rocks came from.

Just then Sandra Passchier, a sedimentologist from Montclair State University in New Jersey, points out something special in another section: embedded in stone, two conjoined circles of white, each the size of a pencil eraser. They are the cross section of a fossil shell called a foram.

"They're single-celled organisms related to amoebas," she says. "They have these little feet that they stick out of their shell to feed."

"I haven't seen any that big before," says Fielding as he gazes at the wonder. It's a single cell large enough to see—a Neanderthal amoeba.

These surprises are part of the fun of looking at cores. A core is a blind stab into the past: a four-inch aperture through which to view an entire epoch of history. That narrow gaze is sure to overlook some prizes—like a rare specimen that the drill misses an inch to the left.

But then come moments of serendipity, says Fielding: "You're always surprised when you find a large, well-preserved fossil. The chances of hitting a complete mollusk in a four-inch cylinder drilled into the seafloor are pretty slim. And we've had some beautiful fossils."

Each fossil presents an opportunity; not a eureka moment, but at least a chance to reconstruct an ancient environment by identifying the species that lived there.

The process begins in Antarctica at 2 in the morning, and will continue as pieces of the core are picked apart, in labs around the world, for years to come. □

[Editors' note: this story has been edited from the original.]



## Bug's Short Life Is Very, Very Cold

Ohio researchers study freeze-hardy, Antarctic midge

**The Columbus Dispatch, 26 December 2007, by Kevin Mayhood**—When it needs to, the Antarctic midge wrings out more than half its water. Add a few drops to the shriveled midge and you've got instant bug, alive and kicking.

A superhero of the insect world, the quarter-inch midge is frozen all but two months of its two years on Earth and is constantly bombarded with acidic penguin poop, salt spray and harmful ultraviolet light.

Two Ohio researchers led a team that spent the past three years and \$1 million in federal grants to learn how *Belgica antarctica* not only survives in these conditions, but thrives.

"This is basic scientific research," said Richard E. Lee, director of the Zoology Department at Miami University.

Maybe so, but Lee and his partner, Ohio State University entomologist David Denlinger, say this and similar work on other freeze-hardy animals could one day allow doctors to freeze donor hearts, livers and other organs desperately needed for transplantation.

Lee and Denlinger made several trips to Antarctica to study the midge, which lives in the dirt or under rocks along the coast, where it feeds on moss or land algae. After two years of growing through four larval stages, the bugs pupate and then emerge as adults. They mate, lay eggs and die within two weeks.

Lee and Denlinger found that the insects could survive at temperatures as low as 5 degrees Fahrenheit. Although the air temperature can reach 90 below during the winter, the midge dehydrates and insulates itself beneath the ice and snow.

Most insects die when they lose more than 20 percent of their water.

The midge, however, increases concentrations of certain sugars and alcohol that help keep it alive. Denlinger said if the insect remained fully hydrated, "There would be ice formation that would rupture the cells and kill them."

Almost all animals produce what are called heat shock proteins that appear to help maintain normal cell operations, but only during temperature stress.

In midge larvae, this protein generator is always running. Denlinger and Lee say the preemptive strike might protect the bug from the acidic penguin guano, sea salt and the lack of oxygen beneath the ice and snow.

The scientists also found that the bugs can acclimate to the very cold in just an hour, a phenomenon called "rapid cold hardening."

As for ultraviolet rays, the midges have developed antioxidant defenses, Denlinger said.

The researchers say there is much more to learn, and they are looking for

a new grant that would pay for an investigation of the bug's life during the coldest months of the dark winter.

**A superhero of the insect world, the quarter-inch midge is frozen all but two months of its two years on Earth ...**

### Midge facts

- There are more than 2,000 species, about 200 of which live in North America.
- Wormlike midge larvae develop in lakes, ponds, slow-moving streams, drainage ditches, very wet mud and even in highly polluted water.
- Most adult midges live about a day, although the adults of some species can live up to a week.
- Some species, called "no-see-ums," bite humans, but none transmit diseases to people.
- Each female can lay more than 200 eggs.
- Bats, birds and fish eat midges, and midge larvae help break down decaying organic matter.
- The vast majority of midges are harmless, but in some regions of the world they can transmit some livestock pathogens. □

Sources: Washington State Extension Service, Intelligent Insect Solutions, World Book Encyclopedia



# Climate Models Overheat Antarctica

**National Center for Atmospheric Research (NCAR) press release, 7 May 2008**—Computer analyses of global climate have consistently overstated warming in Antarctica, concludes new research by scientists at NCAR and Ohio State University. The study can help scientists improve computer models and determine if Antarctica will warm significantly this century, a major research question because of Antarctica's potential impact on global sea-level rise.

"We can now compare computer simulations with observations of actual climate trends in Antarctica," says NCAR scientist Andrew Monaghan, lead author of the study. "Over the past century, most of Antarctica has not undergone the fairly dramatic warming that has affected the rest of the globe. The challenges of studying climate in this remote environment make it difficult to say what the future holds for Antarctica's climate."

The study marks the first time that scientists have been able to compare records of the past 50 to 100 years of Antarctic climate with simulations run on computer models. Researchers have used atmospheric observations to confirm that computer models are accurately simulating climate for the other six conti-

nents. The models, mathematical representations of Earth's climate system, are a primary method for scientists to project future climate.

While climate models accurately simulate the last century of warming for the rest of the world, they have unique challenges simulating Antarctic climate because of limited information about the continent's weather.

The authors of the study, published in *Geophysical Research Letters*, compared recently constructed temperature data sets from Antarctica, based on data from ice cores and ground weather stations, to 20th century simulations from computer models used by scientists to simulate global climate. While the observed Antarctic temperatures rose by about 0.2°C over the past century, the climate models simulated increases in Antarctic temperatures during the same period of 0.75°C.

The error appeared to be caused by models overestimating the amount of water vapor in the Antarctic atmosphere, the new study concludes. The reason may have to do with the cold Antarctic atmosphere handling moisture differently than the atmosphere over warmer regions.

The models, however, have correctly captured trends in Antarctic snowfall, in-

cluding increases in snowfall in the late 20th century, prior to a decrease over the last decade.

Part of the reason that Antarctica has barely warmed has to do with ozone depletion. The lack of ozone is chilling the middle and upper atmosphere, altering wind patterns in a way that keeps comparatively warm air from reaching the surface. Unlike the rest of the continent, the Antarctic Peninsula has warmed by several degrees, in part because the winds there are drawing in warmer air from the north. The models generally capture these wind changes, although sometimes incompletely.

The study delivered a mixed verdict on Antarctica's potential impact on sea-level rise. The Intergovernmental Panel on Climate Change has estimated that sea-level rise could amount to 18-59cm this century, in part because of melting glaciers worldwide. The study suggests that warming in Antarctica over the next century could offset that by about 5cm if the continent warms by 3°C, as computer models have indicated. The reason is that the warmer air over Antarctica would hold more moisture and generate more snowfall, thereby locking up additional water in the continent's ice sheets. □

## Cracking Questions of West Antarctica Glacier Thinning



Antarctic boulders the size of footballs.

**British Antarctic Survey press release, 26 February 2008**—Football-sized boulders could help scientists predict the West Antarctic Ice Sheet's (WAIS) contribution to sea-level rise according to new research published

in *Geology*. Scientists from BAS, Durham University and Germany's Alfred Wegener Institute collected boulders deposited by three glaciers in the Amundsen Sea Embayment—a region currently the focus of scientific attention because it is changing faster than anywhere else on the WAIS and it has the potential to raise sea-level by around 1.5m.

Analysis of the boulders has enabled the scientists to start constructing a long-term picture of glacier behavior in the region. An urgent task is to put recent ice sheet changes into a historical context, and determine if these are part of a natural retreat since the end of the

last glacial period (about 20,000 years ago), or if they are a result of recent human-induced climate change.

Initial results show that Pine Island Glacier has 'thinned' by around 4 centimeters per year over the past 5,000 years, while Smith and Pope Glaciers thinned by just over 2 cm per year during the past 14,500 years. These rates are more than 20 times slower than recent changes: satellite, airborne and ground based observations made since the 1990s show that Pine Island Glacier has thinned by around 1.6 meters per year in recent years.

The scientists reached their conclusions by investigating how long the boulders have been exposed to cosmic radiation rather than being shielded by ice or sediment. □



## Scientists Find Active Volcano In Antarctica

**New York Times, 21 January 2008, by Kenneth Chang**—Here is another factor that might be contributing to the thinning of some of the Antarctica's glaciers: volcanoes.

In an article published Sunday on the Web site of the journal *Nature Geoscience*, Hugh F. J. Corr and David G. Vaughan of the British Antarctic Survey report the identification of a layer of volcanic ash and glass shards frozen within an ice sheet in western Antarctica.

For Antarctica, "This is the first time we have seen a volcano beneath the ice sheet punch a hole through the ice sheet," Dr. Vaughan said.

Heat from a volcano could still be melting ice and contributing to the thinning and speeding up of the Pine Island Glacier, which passes nearby, but Dr. Vaughan doubted that it could be affecting other glaciers in West Antarctica, which have also thinned in recent years. Most glaciologists, including Dr. Vaughan, say that warmer ocean water is the primary cause.

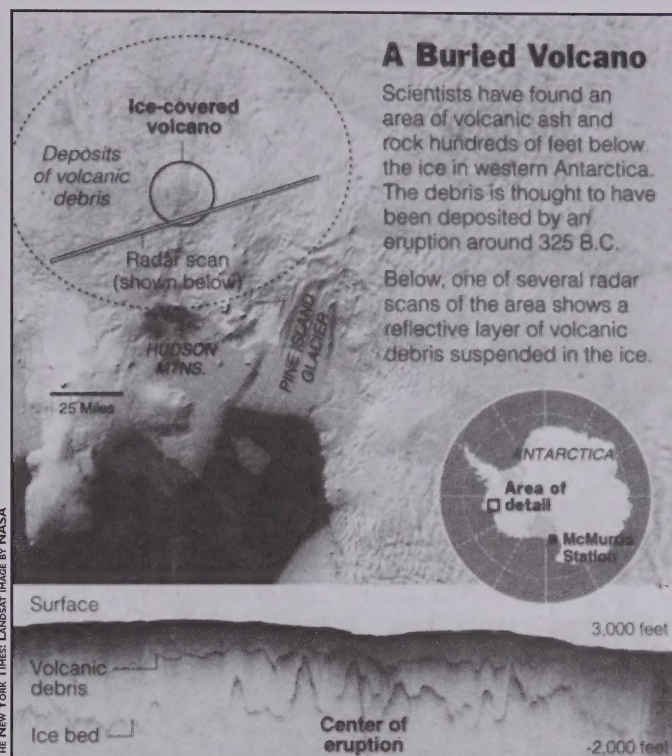
Volcanically, Antarctica is a fairly quiet place. But sometime around 325 B.C., the researchers said, a hidden and still active volcano erupted, puncturing several hundred yards of ice above it. Ash and shards from the volcano carried through the air and settled onto the surrounding landscape. That layer is now out of sight, hidden beneath the snows that fell over the subsequent 23 centuries.

Although out of sight, the layer

showed up clearly in airborne radar surveys conducted over the region in 2004 and 2005 by American and British scientists. The reflected radio waves, over an elliptical area about 110 miles wide, were so strong that earlier radar surveys had mistakenly identified it as bedrock. Better radar techniques now can detect a second echo from the actual bedrock farther down.

The thickness of ice above the ash layer provided an estimate of the date of the eruption: 207 B.C., give or take 240 years. For a more precise date, Mr. Corr and Dr. Vaughan turned to previous observations from ice cores, which contained spikes in the concentration of acids, another byproduct of eruptions. Scientists knew that an eruption occurred around 325 B.C., plus or minus a few years, but did not know where the eruption occurred. "We're fairly confident this is the same eruption," Dr. Vaughan said.

Now, they know both time and place.



### A Buried Volcano

Scientists have found an area of volcanic ash and rock hundreds of feet below the ice in western Antarctica. The debris is thought to have been deposited by an eruption around 325 B.C.

Below, one of several radar scans of the area shows a reflective layer of volcanic debris suspended in the ice.

"It's probably within Alexander the Great's lifetime, but not more precise than that," Dr. Vaughan said.

The under-ice eruption was probably similar to one in Iceland in 2004. Although explosive, spewing ash more than seven miles in the air, the Iceland eruption was much less powerful than Mount St. Helens, the volcano in Washington State that blew off its peak in 1980. □

## Google to the Rescue

**Stuff.co.nz, 31 December 2007**—What's the difference between the worst and the best journey in the world? For a team of researchers lost in fog in Antarctica, it was a satellite phone and a girlfriend in the United States with access to the internet search engine Google.

A perilous 1911 winter journey to the penguin colony at Cape Crozier by Apsley Cherry-Garrard, Edward Wilson and Birdie Bowers of Robert Scott's Antarctic expedition was chronicled in *Cherry-Garrard's The Worst Journey In The World*.

This week, five US penguin researchers who tried to retrace part of the journey

became lost in fog, but were saved by technology their predecessors could not have imagined.

On Christmas Day under bright sunshine and blue skies, science writer Hugh Powell said, they set off to walk to the rough stone shelter built by Scott's men, but became lost when fog rolled in.

"We walked in circles for a couple of hours hoping to stumble in the right direction, but finally decided we were officially lost when we ventured onto a snowfield and found ourselves completely suspended in white," said Viola Toniolo.

The researchers had GPS units but for-

got to bring the co-ordinates for the stone igloo. Fortunately, they had a satellite phone.

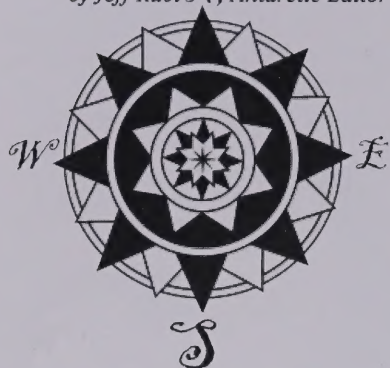
"Hugh rang up his girlfriend, Mia in the US, and dictated the Google search terms over the shaky, time-delayed connection: 'stone', 'igloo', 'crozier', 'aspa' (for Antarctic Specially Protected Area), and 'gps co-ordinates'," Toniolo said. "Within seconds she found the prized numbers, we plugged them into (the) GPS unit, and the five of us trudged towards our invisible goal with renewed confidence. It was 1000m from where we had declared ourselves lost." □



# Goodbye, Denise—and Thanks

## Due South

by Jeff Rubi *N*, Antarctic Editor



When IAATO, the International Association of Antarctica Tour Operators, was founded in 1991 "to advocate, promote and practice safe and environmentally responsible private-sector travel to the Antarctic," there were just seven members, each of them a private tour company in competition with the others. Only one, a Canadian company, was not from the U.S., making the organization American in all but name.

Today, 17 years later, IAATO has 105 members (all still fiercely competing for customers)—and is truly international, with members from Argentina, Australia, Belgium, Canada, Chile, France, Germany, Italy, Japan, the Netherlands, New Zealand, Norway, Sweden, the United Kingdom, the U.S. and the Falkland Islands (Islas Malvinas).

Denise Landau has led IAATO for the past nine years, the majority of IAATO's existence. She has overseen not only the group's tremendous growth in membership—but also a *tripling* of visitors to Antarctica from 14,762 in 1999, her first year, to 46,091 in 2007-08, of which 32,457 actually landed in Antarctica.

Next season, that number is expected to rise to 49,000, with three-quarters of those passengers landing

Denise's service to Antarctic tourism, however, long precedes her tenure as IAATO executive director. She served on IAATO's executive committee for seven years prior to that.

Denise first visited Antarctica in 1991, and the continent has clearly captured her heart.

As of 1 July 2008, however, IAATO will have to manage without Denise, who is stepping down. Her successor is Steve Wellmeier, a marketing executive at Elegant Cruises and Tours in Port Washington, New York which operates the 104-passenger M.S. *Andrea* in Antarctica.

Steve has big shoes to fill.

Denise Landau has built bridges between the tourism industry, governments and environmental groups for the last 30 years.

One of her primary achievements at IAATO is her productive interaction with Antarctic Treaty parties at their annual consultative meetings. IAATO and the Treaty organization now have a firm working relationship, with each regularly inviting the other to participate in meetings, conferences and symposia together.

*Denise's tenacity in presenting the views of the Antarctic tourism industry tactfully but insistently ... is widely admired in Antarctic circles.*

IAATO's claim to promote environmentally-responsible tourism is no hollow boast, for IAATO works cooperatively not only with the Antarctic Treaty system but also with individual governments to protect Antarctica.

One long-time observer of Antarctic tourism has described Denise's continuous efforts to keep the Antarctic Treaty parties fully and honestly apprised of tourism activities in Antarctica as "wonderfully successful."

Another person who regularly attends Treaty meetings reported to me that Denise has gradually earned the respect of the Antarctic nations, which have come to view Antarctic tourism as properly managed. Many governments—and their representatives—



Denise Landau

were not, initially, favorably inclined toward Antarctic tourism.

It is clear that the Treaty parties have had no wish to manage Antarctic tourism directly. So far they have preferred to remain in an observer position to ensure that the Environmental Protocol is followed.

Denise's tenacity in presenting the views of the Antarctic tourism industry tactfully but insistently, with a firm commitment to the organization she represents, is widely admired in Antarctic circles.

Importantly, Denise leaves IAATO with all the tour companies visiting Antarctica as IAATO members, the first time in many years that membership has been 100% of all Antarctic tour operators.

That unity is now more critical than ever. With the sinking of *Explorer* last November and Antarctic tourism's ever-increasing rate of expansion, more intense scrutiny from both the Antarctic Treaty system and individual governments is certain in coming years.

Having previously worked at Quark Expeditions, Clipper Cruise Line, and the U.S. National Park Service, Denise will be in great demand among the tour companies for her expertise.

First, though, she might want to take a little time off.

She greatly deserves it—and the thanks of all of us who care about Antarctica. □



# Antarctic Notes

## Korea to Set Up Second Base

**Arirang News, 22 May 2008**—Twenty years after the first team of Korean explorers set up King Sejong station, plans are afoot to build a second base in the Antarctic. Five sites are being eyed; a location further south from the original one at Cape Burks appears the most likely choice. Following approval by the Ministry of Land, Transport and Maritime Affairs, construction will begin later this year, targeting a 2012 completion and requiring funding of almost US\$64 million.

## Google Earth's New View of Climate Change

**British Antarctic Survey (BAS) press release, 19 May 2008**—A project launched today will allow Google Earth users to see how climate change could affect the planet over the next century, along with the loss of Antarctic ice shelves over the last 50 years. "Climate Change in Our World" is a collaboration between Google, the UK Government, the Met Office Hadley Centre and British Antarctic Survey. Viewers can see world temperatures for the next 100 years under medium projections of greenhouse gas emissions, as well as the retreat of Antarctic ice shelves since the 1950s.

## 'Brittlestar City' Discovered

**The [Melbourne] Age, 19 May 2008, by Deborah Smith**—Tens of millions of starfish-like inhabitants perch atop a 750m high seamount with its peak only 90m below the surface. The flat-topped seamount is part of Macquarie Ridge stretching 1400km from New Zealand to just north of the Antarctic Circle. The brittlestars, relatives of starfish, sea cucumbers and sea urchins, survive by raising their arms into the swirling waters of the Antarctic Circumpolar Current that rush by at about 4 km/h, bringing food while sweeping away predators. The colony, the first of its kind ever seen, was found last month by Australian and New Zealand scientists.

## McMurdo 'Smurf Shed' Destroyed

**Christchurch Press, 15 May 2008, by John Hartevelt**—The "smurf shed" at Antarctica's McMurdo station has been destroyed by fire hours after staff met to discuss fire safety. The last time staff met for a safety meeting they discussed vehicle safety and hours later a Hagglund vehicle rolled over. The small blue mobile shed that stored equipment used for maintaining roads went up in flames on Monday at 10.20am at Pegasus Airfield. Fire crews rushed to put it out but all that was left when they arrived were two fuel tanks burning furiously. It was the latest in a series of unfortunate events at McMurdo. Late last year a bad Santa was reprimanded over "inappropriate touching." There was also what was believed to be Antarctica's first car chase on Ross Island.

## Ice Shows CO<sub>2</sub> at 800,000-Year High

**Bloomberg, 14 May 2008, by Alex Morales**—Ancient air bubbles trapped in Antarctic ice have revealed that levels of CO<sub>2</sub> and methane in the atmosphere are at their highest in 800,000 years, two studies in *Nature* said. Analysis of a 3.3km ice core extended the existing record of atmospheric greenhouse gases by 150,000 years and showed

that concentrations of CO<sub>2</sub> and methane fluctuated within bands well below today's levels, said Thomas Stocker, co-author of both papers. "The fundamental conclusion that today's concentrations of these greenhouse gases have no past analogue in the ice-core record remains firm," Ed Brook, a geoscientist at Oregon State University, wrote in an accompanying article. "The remarkably strong correlations of methane and CO<sub>2</sub> with temperature reconstructions also stand."

## Russian Circumnavigates Antarctica

**Albany and Great Southern Weekender, 8 May 2008**—Solo adventurer Fedor Konyukhov sailed into Western Australia's King George Sound and the history books yesterday, becoming the first person to sail around Antarctica south of 40°S. Konyukhov was at sea for 102 days, covering 29,600km aboard his yacht *Trading Network Aye Parusa*.

## Scientists Find Toxic Chemicals in Penguins

**telegraph.co.uk, 8 May 2008, by Paul Eccleston**—Toxic chemicals, including polychlorinated biphenyls (PCBs) and other industrial chemicals which have been linked to health problems in humans, may be seeping into the oceans as glaciers melt through global warming. Traces of DDT were found by scientists who tested Adélie penguins. They believe glaciers have been acting as a cold store for DDT which was in worldwide use as an insecticide before it was banned because of its environmental impact and fears for human health. Small airborne particles of DDT were carried naturally to the poles where they became trapped, probably during the 1960s, when the ice sheets were expanding. They are now being released as the ice melts. Heidi Geisz, a marine biologist at Virginia Institute of Marine Science, led a team that sampled DDT levels in the penguins. A 1964 survey found small amounts of the pesticide in Adélie, and she expected to see even less now. Instead, her team found DDT levels unchanged in birds that live near the continent's western peninsula. Geisz fears that this may indicate that many other chemicals frozen in the ice may also be leaking into the surrounding oceans. "DDT is not the only chemical that these birds are ingesting and it is certainly not the worst," she said in a report in *New Scientist*.

## Wilkins Ice Shelf 'Hangs by Thread'

**BBC News, 25 March 2008, by Helen Briggs**—The Wilkins Ice Shelf, stable for most of the last century, has started to break away from Antarctica in what scientists say is further evidence of a warming climate. Satellite images suggest that part of the ice shelf is disintegrating and will soon crumble away. The Wilkins began retreating in the 1990s. Six ice shelves in the same part of the continent have already been lost, says the British Antarctic Survey's David Vaughan: "Wilkins is the largest ice shelf on the Antarctic Peninsula yet to be threatened. The ice shelf is hanging by a thread - we'll know in the next few days or weeks what its fate will be." Dr Ted Scambos of the National Snow and Ice Data Center at the University of Colorado said: "This unusual show is over for this season. But come January, we'll be watching to see if the Wilkins continues to fall apart."

## Hibernation-Like Behavior in Notothenia

**British Antarctic Survey press release, 5 March 2008, by Linda Capper**—An Antarctic fish species adopts a winter survival strategy similar to hibernation. In the online journal *PLoS ONE*, scientists from BAS and the University of Birmingham reveal that Antarctic 'cod' *Notothenia coriiceps* effectively 'puts itself on ice.' The fish activate a seasonal 'switch' in ecological strategy - going from one that maximizes feeding and growth in summer to another that minimizes the energetic cost of living during winter. Dr Keiron Fraser from BAS says, "The interesting question we still have to answer is why these fish greatly reduce feeding in winter when food is still available."

## Helicopter Crash Kills Two

**Associated Press, AMSTERDAM, 3 March 2008**—A research helicopter has crashed in Antarctica, killing its German pilot and a Dutch technician. The cause is not known. Three others were injured in Sunday's accident, which happened under clear skies as the helicopter was shuttling between the German ship *Polarstern* and Germany's Neumayer II station.

## Thompsons Win Dan David Prize

**Ohio State University press release, 21 February 2008, by Earle Holland**—OSU glaciologist Lonnie Thompson and climatologist Ellen Mosley-Thompson are among this year's winners of the prestigious Dan David Prize. The annual prize awards \$1 million to winners in each of three categories—past, present and future. Thompson and Mosley-Thompson will share the \$1 million award with British geologist Geoffrey Eglinton for the "future."

## Krill Living in the Abyss

**British Antarctic Survey press release, 21 February 2008**—Scientists have discovered Antarctic krill living and feeding down to depths of 3000m around the Antarctic Peninsula. Until now krill was thought to live only in the top 150m of the water column. The discovery completely changes scientists' understanding of the major food source for fish, squid, penguins, seals and whales. Reporting in *Current Biology*, scientists from BAS and the National Oceanography Centre, Southampton used a remotely-operated vehicle (ROV) to film previously unknown behavior of krill.

## Russia Puts Flag on Antarctic Sea Bed

**mercopress.com, 19 February 2008**—Six months after planting its flag on the North Pole seafloor, Russia has done the same in the south in a clear expression of its renewed ambitions in Antarctica and its natural resources. "The Russian flag was planted on Thursday in the geomagnetic South Pole sea bed, at 64°28'S 137°37'E," said Sergei Baliasnikov from the Arctic and Antarctic Research Institute. The "symbolic" operation took place at the bottom of the D'Urville Sea by the research vessel *Akademic Karpinski*. The head of the Russian Antarctic expedition, Valeri Lukin, said that an estimated 51 billion tons of hydrocarbons are trapped in the Antarctic continental shelf, adding that the dynamics of "world prices and markets for commodities could influence a decision from the international community" regarding the exploitation of those energy resources.

CONTINUED ON P. 10



### Scientists Investigate 'Plastic Soup'

**Radio Australia, 17 February 2008, by Barbara Heggen**—Scientists from the University of Hawaii are planning to conduct a comprehensive study of a giant floating plastic mass in the North Pacific Ocean. It has already been reported by Chilean scientists that a similar mass exists in the Southern Ocean near Antarctica.

### Sharks Headed to Antarctica?

**University of Rhode Island press release, 13 February 2008**—It has been 40 million years since the waters around Antarctica have been warm enough to sustain sharks and most fish, but they may return this century due to global warming. If they do, the impact on Antarctic ecology could be serious, according to researchers from the University of Rhode Island who analyzed the physiological adaptations and metabolism of sharks and other warm-water predators and concluded that an increase of just a few degrees Celsius could make Antarctic waters hospitable to some species. Their study, "None Like It Cold: Physiological Constraints on Predators in Antarctica," was presented today at the meeting of the American Association for the Advancement of Science. Crabs, also absent from Antarctic waters for millions of years, are also likely to make a comeback. Warming seas around Antarctica have already led some predatory crabs to move closer to the Antarctic shelf environment.

### Venezuela's Antarctic Ambitions

**Associated Press, CARACAS, 11 February 2008**—President Hugo Chavez saw off a team of scientists Sunday who will participate in Venezuela's first expedition to Antarctica, made possible thanks to cooperation between the Venezuelan and Uruguayan navies. Venezuela is providing about US\$558,000 along with fuel for the Uruguayan ship and supplies. Venezuela hopes to be able to build a permanent Antarctic station.

### New Antarctic Dinosaur

**National Geographic News, 12 December 2007, by Blake de Pastino**—Scientists recently identified an enormous Jurassic plant-eating dinosaur called *Glacialisaurus hammeri* (the name honors Dr. William R Hammer, professor of geology at Augustana College) more than a decade after its fossilized foot, ankle and leg bones were discovered 4,000m up the face of Mount Kirkpatrick. Weighing six tons and measuring 7.6m long, *Glacialisaurus* belonged to a group of dinosaurs called sauropodomorphs that were the largest to have ever walked the Earth. Nathan Smith, a graduate student at Chicago's Field Museum, and Argentinean paleontologist Diego Pol report their findings in the online edition of *Acta Palaeontologica Polonica*.

### Larsen B Didn't Just Melt

**Western Mail, 7 February 2008, by Abbie Wightwick**—When the 10,000-year-old 400m thick Larsen B ice shelf collapsed in 2002, it was assumed to be a victim of climate change. But a controversial paper in the *Journal of Glaciology* co-written by Dr Ted Scambos of the University of Colorado's National Snow and Ice Data Center and Neil Glasser of

Aberystwyth University says the glacier may have crumbled anyway. It was riddled with cracks and fault lines and weakened by sea currents beneath, Glasser says: "Climate change may have been the last straw, but it was not the only straw... Our new study shows that ice-shelf break-up is not controlled simply by climate. A number of other atmospheric, oceanic and glaciological factors are involved."

### Antarctic Glaciers Melting Faster

**San Francisco Chronicle, 26 January 2008, by David Perlman**—Antarctica's massive coastal glaciers are quickly melting into the sea as the oceans around the continent grow warmer—and the pace of ice loss is speeding up. An international satellite network measuring the thickness of the glaciers as they shrink year by year has found that the glaciers have melted so rapidly during the past 10 years that the continent is losing almost as much ice as Greenland. The team from Chile, England and the Netherlands is led by Eric Rignot at UC Irvine and NASA's Jet Propulsion Laboratory who has watched the shrinking glaciers and gathered data for the past 15 years from polar-orbiting satellites. The Bellinghousen and Amundsen seas are warming, and as their water temperatures rise they melt the undersides of the ice sheets so the sheets become thinner and the seas intrude farther and farther inland—to melt still more of the ice. That increase has nearly doubled in the past 10 years, Rignot estimated.

### Orcas Make Waves to Get Meals

**Nature.com, 14 December 2007**—Some Antarctic orcas use the cunning tactic of regularly hunting in packs and making waves to wash seals off floating ice, researchers have confirmed. The behavior was first seen in 1979, but it was then considered a one-time moment of orca ingenuity. Now, Ingrid Visser of the Orca Research Trust in New Zealand and her colleagues report on six further observations of the animals using group hunting behaviour to divide ice floes, push them into open water, and create waves to wash animals off them into their waiting jaws. The behavior, seen only along the Antarctic Peninsula, is reported in *Marine Mammal Science*. A recent video showing the behavior is available on YouTube.

### Mars Clue in Dry Valleys

**Ohio State University press release, 10 December 2007, by Pam Frost Gorder**—Scientists have gathered more evidence that suggests flowing water on Mars, by comparing images of several sites on Mars, where water appears to have flowed to the surface and left behind a trail of sediment, to places where water flows today in the Dry Valleys. The new study bolsters the notion that liquid water could be flowing beneath the surface of Mars. And since bacteria thrive in the liquid water flowing in the Dry Valleys, the find suggests that bacterial life could exist on Mars as well. "If you looked at pictures of both landscapes side by side, you couldn't tell them apart," says Berry Lyons, professor of earth sciences and director of the Byrd Polar Research Center at Ohio State University.

### WAIS Divide Gets First Cores

**National Science Foundation press release, 22 January 2008**—Researchers today finished the inaugural season of the West Antarctic Ice Sheet (WAIS) Divide Ice Core Project, recovering a 580m ice core, the first section of what is hoped to be a 3,465m column of ice detailing 100,000 years of Earth's climate history, including a precise year-by-year record of the last 40,000 years. Fieldwork is expected to finish in January 2010.

### First Flight to Wilkins

**Australian Broadcasting Corp., 11 January 2008**—Australia's Antarctic air link has opened, with the first passenger flight—an Airbus 319—taking nine hours to complete a return trip from Hobart last night to the 4km Wilkins Runway, 70km from Casey Station. Passengers including federal environment minister Peter Garrett spent almost three hours on the ground.

### Glaciers Formed During a Warm Period

**Reuters, OSLO, 11 January 2008**—Giant glaciers formed about 90 million years ago during a warm period when alligators thrived in the Arctic, researchers reported in *Science*, calling into question the belief that all ice melts in a "super greenhouse" climate. The researchers' study, based on organic molecules in ocean sediments and chemicals in ancient fossil shells, indicated that there were ice sheets in Antarctica in parts of the Turonian period, one of the warmest times in history, when dinosaurs thrived. How other parts of the world were cold enough for ice to form is still unclear, the scientists said.

### Fram Strikes Berg, Crushes Lifeboat

**Agence France-Presse, BUENOS AIRES, 29 December 2007**—The Norwegian cruise ship *MS Fram*, carrying 256 passengers and 70 crew, struck an iceberg as it drifted in Antarctic Peninsula waters of after an engine failure, Argentine officials said today. No one was injured, but a lifeboat was crushed. The ship "was carried into a wall of ice" after it suffered a two-hour blackout near Brown Bluff.

### Fossilized Burrows Found Near Beardmore

**Society of Vertebrate Paleontology, 30 May 2008**—New fossil finds are shedding light on what Antarctica was like 250 million years ago. In the latest issue of the *Journal of Vertebrate Paleontology*, Chris Sidor of the University of Washington and his colleagues Molly Miller of Vanderbilt University and John Isbell of the University of Wisconsin-Milwaukee report the discovery of a number of fossilized burrows of land-living animals in Antarctica. The first type, found in the Beardmore Glacier region, is almost 250 million years old and resembles burrows known in South Africa of a similar age. The South African burrows have been found containing the fossilized skeleton of a cat-sized mammal-like reptile called *Thrinaxodon*. The second type of burrow is of a smaller variety and was discovered in Victoria Land. Again, comparison with similar burrows in South Africa provides clues to the original inhabitants of the burrow. Miller noted that they were probably made by "mole-sized reptiles known as proclophionids. But until we find the animal in the burrow we can't be sure." □



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## Robotic Plane Takes to the Air

A pair of lightweight, robotic planes have made the first unmanned flights over Antarctica's icy expanses.

Driven by propeller, the machines made 20 low-altitude sorties, including four over the Weddell Sea.

The unmanned aerial vehicles (UAVs) were launched by catapult but flew autonomously until landing.

During some of the test flights the machines were fitted with miniaturised instruments to collect data for use in predictive climate models.

"One of the biggest uncertainties in those models is the physics of sea-ice—how it freezes and how it melts," said Dr Phil Anderson of the British Antarctic Survey (BAS), one of the team that carried out the tests.

"A lot of this happens during the Antarctic winter—the nine-month period when we can't get ships and aircraft to the bases—so we decided to see if we could [collect this data] by robot aircraft."

### Mobile Machines

Tests of the tiny planes, which were designed by the Technical University of Braunschweig (TUBS), started in the Antarctic winter of 2007.

The 2m-wingspan craft are launched by a giant elastic band which catapults them into the sky.

It is initially radio-controlled until it reaches its target altitude of 50m, at

which point the autonomous control systems kick in.

"We don't fly the mission with a radio control or with a little video camera on-board," Dr Anderson told BBC News. "It's all up to the little aircraft to make up its own mind."

However, the area in which the plane is allowed to fly is controlled by setting a series of artificial boundaries in its navigation system and the landing must also currently be radio-controlled.

In the future this will be done automatically, said Dr Anderson.

The machines are powered by lithium-ion batteries—similar to those found in mobile phones—which are able to keep the UAV in the air for 45 minutes.

In that time it can cover 45km (28 miles), taking 100 measurements per second.

"The miniaturised instruments can actually measure how much heat is flowing from the atmosphere into the sea-ice," Dr Anderson told BBC News.

This collected data can then be fed into climate models to improve their accuracy.

"We can then run [the models] into the future and get a better idea of what it holds for us in terms of the climate," he said.

### Big Future

Flying the UAVs in the extreme conditions of the Antarctic is not without problems.

As well as the difficulty of handling the

machines in thick gloves and mitts, the cold played havoc with the sensitive electronic equipment and even the elastic bungee cord used to loft the craft into the air.

"We found that it set solid at -10C; so we had to build a very long, snaky duvet cover to go over the bungee just to keep it warm enough, long enough, to do the launch," he explained.

However, Dr Anderson believes the craft will play a big part in future exploration of the continent, surveying hard to reach and dangerous places.

This capability has been exploited for a long time by the military which uses UAVs for surveillance and communication.

As such, research efforts are ongoing around the world to boost the endurance, range and capabilities of craft.

Last year, UK defence firm Qinetiq smashed the official world record for the longest-duration unmanned flight when its vehicle flew for 54 hours during tests.

The Zephyr plane could be used for military applications, as well as for Earth-observation and communications, according to the company.

Earlier this year, the US National Oceanic and Atmospheric Administration (Noaa) announced a \$3m (£1.5m) investment into the technology.

It will use UAVs to track hurricanes and Pacific storms, as well as monitor summer ice-melt in the Arctic.

"Their time has come," said Dr Anderson. □

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## Turning Tide of Whaling Opinion

**BBC News, Tokyo, 14 April 2008, by Chris Hogg**—Japan caught only 60% of its quota of whales this season and the Sea Shepherd Conservation Society, whose members clashed most violently with the Japanese whaling fleet, said it had "saved" hundreds of whales. But Greenpeace, the other conservation group who tailed the Japanese fleet through the waters of the Southern Ocean around Antarctica, pointed out that 551 whales were still caught this year—considerably more than the 440 caught three years ago. Japan's quotas have been far greater in the past couple of years than they used to be.

Officials originally said they were targeting 850 minke whales, 50 fin whales

and 50 humpbacks. Within weeks Tokyo changed its mind about the humpbacks, which had been protected by international agreements for decades, in what Japan described as a gesture to try to pacify its opponents.

Disruption cost the hunt 31 days in total. The Japanese seemed unwilling to be filmed or photographed whaling, so just tailing them closely was enough to disrupt operations for days at a time. Now Japan says "sabotage" by activists "was a major factor behind our failure to achieve our target." But a fisheries agency official made clear it was not the only factor. He said few fin whales were spotted, another reason why none of them were caught.

Nevertheless, for the first time in 20 years protesters are being blamed for Japan's failure to meet its quota.

The biggest concern for the Japanese whalers may be the financial costs of not fulfilling their quota. The meat is sold to consumers to try to defray some of the costs of the whaling industry. The shortfall is made up by a subsidy from the Japanese taxpayer. It is unlikely, however, that bringing home fewer whales from the Southern Ocean will raise prices because of a shortage of supply. There is reported to be a glut in the market already. □

[Editors' note: this story has been edited from the original.]



# General David L. Brainard, U.S. Army

## *Last survivor of the United States' Lady Franklin Bay Expedition (1881-84)*

by Glenn M. Stein, FRGS

He didn't know it at the time, but David Legg Brainard was to become one of those rare individuals in military history who rose from Private to General by pulling himself up by the bootstraps. The fifth son of Alanson and Maria (née Legg) Brainard, was born on his parents' farm in Norway, New York, on 21 December 1856. He attended public school in Norway and when David was ten years old, the family moved to the John Corp farm at Freetown, New York, where Alanson also operated a dairy. David attended the State Normal School in Cortland, and when not in class indulged in horseback riding around the farm—a pastime that was to serve him well in the very near future.

In September 1876, 19-year-old David left home to travel to Philadelphia and view America's first successful world's fair, the Centennial Exposition. During this 100th birthday of the nation, the country proudly displayed its agricultural and industrial ingenuity. In addition, relics from the ill-fated Franklin Expedition, obtained by the American Arctic explorer Charles Francis Hall, were in the U.S. Naval Observatory's Arctic exhibit and one cannot help but wonder if young Brainard viewed these grim artifacts.

After taking in many marvels of the Machine Age, Brainard boarded a train for home. At New York City, he changed trains and reached into his pocket for money to buy a ticket, but there was none. Too proud to write his family for funds, Brainard took the free ferry to the U.S. Army Post at Governor's Island and joined the Regular Army. He was perhaps also inspired by memories of older brother Henry, who joined the 186th New York Infantry as a teenage soldier in the Civil War.

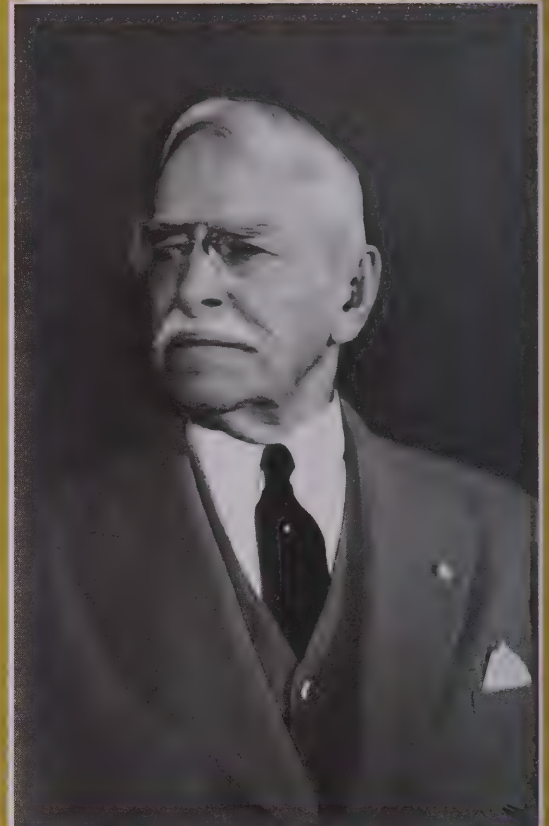
While putting on his new uniform, the young man found a ten dollar bill hidden away in his civilian shirt pocket, but it was too late—he was Private David L. Brainard now. Brainard even chided himself years later, as he wrote privately during an Arctic expedition, 'It is just five years ago today since I left

home to make an ass of myself by joining the regulars.'

When Brainard joined the Army, it had been only three months since Custer's command was mauled at the Little Big Horn, and in no time, Brainard was sent to Company L, Second Cavalry, Fort Ellis, Montana Territory, to serve against the Northern Cheyenne and Sioux Indians (and later the Nez Perce and Bannock Indians). The square-jawed Brainard was a keen soldier, who firmly believed orders clearly issued should be obeyed. The spring of 1877 found Troops F, G, H and L of the Second Cavalry reporting to Col. Miles at Fort Keogh. Along with six companies of infantry, and a company of mounted scouts, Miles' command was numbered in excess of 21 officers and 450 men. They marched south along the Tongue River in early May and picked up the trail of the Sioux chief Lame Deer.

Lame Deer's village was discovered near the mouth of Muddy Creek, and Miles determined to attack the Indians at dawn on 7 May, while most of village's occupants were asleep. In the initial assault, an officer with 20 scouts and mounted infantrymen, plus Troop H, Second Cavalry, charged through the left side of the camp and stampeded the pony herd about a half-mile beyond. The warriors tumbled from their tipis, randomly firing as they fled toward the hills around the camp. Troops F, G and L followed their fellow cavalrymen, then wheeled to the right, and engaged the Sioux as they took up positions in the hills.

Wishing to communicate with the fleeing Indians, Miles briefly parleyed with Chief Lame Deer and his nephew, Iron Star, and the shooting stopped. But the situation was very tense and through indiscretions on both sides, shooting erupted and Miles had a very near brush with death, as a bullet fired by Lame Deer narrowly missed the Colonel and killed



Brigadier Gen. David L. Brainard at age 87, April 1944.

his orderly. Pandemonium broke out, and Lame Deer and Iron Star ran about a hundred yards before the Chief was mown down by gunfire from Troop L cavalrymen. Brainard witnessed the moment:

*About this moment the troop to which I was attached dismounted, and we followed the Indians up the precipitous hills. The head-dress made a very conspicuous target, and many shots were fired at the Indian wearing it. Finally he was seen to totter, and the other Indian...placed his hand about the other's waist and supported him up the hill; Lame Deer was seen to take a pistol from his belt and fire backwards in our direction...When the old man fell, Iron Star escaped over the hill through our left, and ran into the face of G troop under Wheeland [sic], and was shot by Wheeland, who used a pistol.*

Miles wanted to clear the high ground of the Indians who were directing sweeping fire against the soldiers below, so he assembled his men into skirmish or-



der and the dismounted troopers of F, G and L advanced up and over a steep, timbered ridge. Troop G flanked the Indians pursued by the other companies and 'slaughtered them right and left and did terrible execution in a few moments.'

By nine in the morning, the attack was over and the cavalrymen chased the warriors and their families into wooded ravines beyond the camp, but found few people. Meanwhile, the camp revealed a large quantity of booty, some of which was a grim reminder of the recent past. At least 30 tons of dried buffalo meat, hundreds of robes, carbines, powder and ammunition—and 'many trophies of the Custer battle and several scalps of white men and women.' Of the herd of 450 captured horses, some bore the Seventh Cavalry brand.

All of the casualties suffered at the Battle of Little Muddy were born by the Second Cavalry: four men killed and nine wounded. The Sioux suffered 14 killed and many wounded during the engagement. Among the troopers wounded was Pte. Brainard, who suffered wounds to his right hand and a gunshot wound to his right cheek, affecting his eye. Over half a century later, in 1933, he received the Purple Heart for his injuries. Of the five Medals of Honor awarded for Little Muddy, four went to Second Cavalry troopers.

By 1878, Brainard's soldierly talents resulted in his promotion to Corporal, and then Sergeant. He needed those talents, and every ounce of mental and physical courage he could muster, when his military career took a dramatic turn that forever changed his life.

### **International Polar Year**

By the late 19th century, nations (in particular Great Britain) had been engaged in Arctic exploration for hundreds of years. Two primary goals were sought: a North-West Passage and the North Pole. The 1800s witnessed more and more blank areas of the Arctic map filled in; by the middle of the century, a North-West Passage was discovered and "farthest north" records were set—but the North Pole still eluded explorers.

In 1875, an Austro-Hungarian naval officer and polar explorer named Karl Weyprecht proposed fixed Arctic observation stations. Together with Bavarian scientist Georg Von Neumayer, in 1879 they proposed an International

Polar Year (IPY). Both men realized that nations needed to stop competing for geographical discoveries and instead should despatch a series of coordinated expeditions dedicated to scientific research. The causes behind the forces of nature could be understood through observations in such fields as meteorology, oceanography and geomagnetism, and would benefit everyone. Eventually, 11 nations took part in the IPY 1882-83; 12 principal research stations were established across the Arctic, along with at least 13 auxiliary stations, and two subantarctic stations. Some 700 men worked to establish and relieve these stations between 1881 and 1884.

### **Howgate Arctic Expeditions**

Capt. Henry W. Howgate, U.S. Army Signal Corps, read Weyprecht's thoughts on Arctic exploration in 1876 and was inspired by them. With promised Congressional support, Howgate's ultimate objective was to place a 50-man scientific colony 500 miles from the North Pole by 1878, at Lady Franklin Bay, Ellesmere Land (discovered to be an island several years later).

Howgate promised First Lieut. G.C. Doane, Second Cavalry, command of the expedition, but he also had in mind his protégé, First Lieut. A.W. Greely, Fifth Cavalry. Although a preliminary expedition was sent to the subarctic, plans for the main expedition were voted down by Congress. Howgate ardently tried to revive his plan and eventually purchased a steamer in Scotland, sailed it to Washington, D.C., in 1880 and gained government backing for his venture.

On 6 May, the Secretary of War wired the Army's Department of Dakota and ordered Lieut. Doane to leave Montana with the eleven specially selected Second Cavalry men whom he selected for the expedition—among them was Sgt. David Brainard. A board of naval officers examined the vessel and determined it was unseaworthy, so the eleven enlisted men were sent back to Fort Ellis. In complimenting the iron constitutions of the men, Doane noted '...the severities of a winter in the northwest where the thermometer goes down to 50° below zero Fahrenheit'.

### **Lady Franklin Bay Expedition**

At length, the U.S. government did

decide to establish a scientific station at Lady Franklin Bay in 1881, as part of the American contribution to the International Polar Year. The expedition adopted the main features of Howgate's plan and represented America's first participation in an international scientific effort. The 25-man Army party was commanded by First Lieut. Greely (Doane had declined to participate).

Greely was a Civil War veteran who had gained extensive experience in the West as the Army's top meteorologist and laying military telegraph wire. Greely was physically tough, experienced in command of men, had a scientific background, but he was also a strict disciplinarian and this feature of his personality played a key role in the ill-fated expedition.

Second Lieut. F.F. Kislingbury and Second Lieut. J.B. Lockwood were Greely's officers and the Doctor and Naturalist was Octave Pavy, a man with limited Arctic experience. Pavy never-

*CONTINUED ON P. 14*



Inuit bone knife brought back by Brainard (Spencer J. Fisher Photography).



## Two Arctic Journeys—a Contrast in Techniques.

by Spencer Apollonio

In the spring of 1962 I was on the north shore of Devon Island in the Canadian Arctic carrying on oceanographic work.<sup>(1)</sup> I wanted data for comparison from inside the threshold of a fjord. The nearest was Grise Fjord on Ellesmere Island, about seventy miles distant, so I set off across Jones Sound on a primitive motor toboggan towing my gear on a Nansen sledge.

Just north of Cape Hardy the copper fuel line broke from the cold and jolting of travel over rough ice. After an hour or so of trying various repair expedients, there came a heavy sigh just behind me. I was startled, indeed. My immediate thought was of a bear close by—we had had several in our camp that winter and spring. But the sigher was a hunter from the village of Grise Fjord with his dog team who had come upon me quietly and unexpectedly by either of us.

He was on his way home and offered to take me. We joined two or three of his fellow travelers camped a mile or so away. During the "night" it began to snow and blow and continued for a day or so. Visibility was poor. We stayed in camp. The one ancient tent was now crowded, and drinking tea was the chief occupation. Since the old tea leaves were never dumped but only accumulated inside the teapot, its volume continually decreased and each new batch of tea became ever more potent. To check on the weather, my friends peered through a hole in the canvas wall of the tent, pulling it open a little hither and enlarging the

hole with each inspection. The increasing snowdrift through the hole confirmed the observations. The tent had the luxury of a floor of linoleum where melted snow collected in puddles.

This was easily and frequently cured by a knife stab that allowed the puddles to drain off the linoleum into the basement.

In good time the weather cleared, and we got under way. There were three sledges as we wound our way through, around and over the ice hummocks across Jones Sound. The journey took several days. Axes were needed to clear a path over a large and long pressure ridge. Crashing over one ice ridge, a sledge runner broke. What now? I wondered. The driver got out his rifle. Is it that bad? I thought. Is sui-



RCMP Leon McCallister and his dog team at the oceanographic station, Grise Fjord, Ellesmere Island. Note that the dogs, sledge, winch and oceanographic gear are all tied together.

cide our only option? But no, it was only a preliminary to repair. Six holes were shot through the runner, three on each side of the break. Then the two pieces were lashed together, a surprisingly (to me) successful repair considering the weight and stress that the lashed runner had to bear over and across rough ice.

Occasionally our slow procession stopped when a seal had been spotted and a hunter took off to bring it home. I lost track of time and direction as the sun circled endlessly and our leisurely journey across the ice ambled here and there. We did in time arrive at Grise Fjord where we met the RCMP con-

### GENERAL BRAINARD - CONTD FROM P. 13

theless thought highly of himself, as he was the only white participant with any polar experience. The party was composed of both infantry soldiers and cavalymen (six being from the Second Cavalry), though four of the men were civilian specialists who were given the ranks of sergeant. The military men had the experiences of campaigning during the bitter winters in the Far West—but even this paled in comparison the Arctic. Finally, two native Greenlanders acted as Hunters and Dog Sledge Drivers.

Brainard had hesitated to volunteer again for Arctic service. In less than a year, his term of enlistment would have ended and he yearned for the freedom of civilian life—he had even saved the misplaced ten dollar bill to celebrate his discharge. But the lure of the Arctic was too strong and after volunteering, he was chosen First Sergeant (Chief of Enlisted Men) and Commissary Sergeant.

The expedition left St. John's, Newfoundland, on 7 July 1881, and Brainard began his daily journal, which he

maintained continuously for nearly three years. A good passage was made and Lady Franklin Bay reached in the first week of August. The base was constructed and named Fort Conger, after the senator who had taken a particular interest in the venture. The expedition's 30-foot steam launch, christened *Lady Greely*, was laid up for the winter, along with the whaleboat. Meteorological, magnetic and tidal observations were initiated and maintained continuously for two years.

CONTINUED ON P. 16



stable, Leon McAllister, who was just setting out to look for me. We loaded my winch and gear on his sledge, and his dogs took us into the fiord. I set up our tent for heat and ran the sampling bottles and very expensive and fragile thermometers, attached to a wire from the winch secured to the sledge, down through a small hole in the ice. But neither of us had thought to secure the sledge or the dogs that were still harnessed to the sledge. When several hundred meters of wire with gear were deep in the fiord, the dogs—we assumed to be asleep—suddenly howled as if about to give chase. The policeman jumped from the tent and got them under control before they dashed off with everything—including my gear—in tow. A near catastrophe, but all is well.

And then it came time to record the temperatures. Where is my pencil? I searched everywhere, with increasing panic, through my gear. No pencil. No pencil!!

The constable noted my distress. I had to tell him that all his trouble on my behalf was for naught. But he saw no problem. "We'll just use a bullet," he said, and he sharpened a 30.06 bullet with his knife. It worked fine—science saved by law enforcement! I still have that original data sheet.

In 1971 I journeyed from Grise Fjord to Eureka weather station and then almost to Cape Columbia on northernmost Ellesmere Island, about 650 miles, with Ahkeeahgo and Tookilkee. By then, dog teams had mostly been replaced by snowmobiles. We had two motor toboggans and two komatiks. My purpose was to trace ice algae from Jones Sound, where they had been relatively well studied, to the edge of the Arctic Ocean where they had not. We started in company with several parties bound on hunting trips and spent the first "night" at the height of land on top of the glacier at the head of Grise Fjord, with six souls all snug in my pyramid tent. The next day the parties went their several ways, and we found our way down into Baumann Fjord and then into Eureka Sound, all easy going. The only contrast in the endless whiteness was a black line far ahead which we found to be a very low reef in the ice composed of nothing but small pieces of shale, almost all with fossil ammonites. My sampling—drilling through the sea ice—went routinely as we camped along the way. For supper one

evening my colleagues shot and cooked a hare. As we passed across the slopes of Stor Island to avoid rough ice, one of the komatiks collapsed sideways; so we had the cold task of unloading and straightening and relashing the sledge.

Visibility was poor as we passed Fosseheim Peninsula. We looked in vain for Sli-dre Fjord and Eureka, and we kept going, at last confronted by a high cliff. We camped, intending to stay there until visibility improved and we could locate ourselves. But I got restless. I drove a machine east to find some clue in the fog. A mile or so along I drove over a very slight rise, and on the far side the machine sank through the ice underneath me. I backed off the rear end as it vanished into the slush. I walked back along my track to the tent and described what had happened to Ahkeeahgo and Tookilkee. They talked it over among



themselves. Then we set out with the other machine to the site. They prodded in the mush ice and hit metal. The machine was only a short distance below the surface, and we pulled it out. They had recognized the particular form of ice created by pressure forming a shallow trough on which the snowmobile rested. Dogs would never have crossed that ice.

The next morning the weather cleared enough so that we found we were in Greely Fjord. We loaded the drowned machine on a komatik and drove into Eureka. While Ahkeeahgo and I stripped and cleaned the motor toboggan in the garage, Tookilkee returned to Greely Fjord to collect all our gear.

The resurrected machine worked fine,

none the worse for its submergence, and we set out again through Nansen Sound in beautiful weather and on to the ice shelf along the northern coast of Ellesmere Island, arriving after several days at the hut on Ward Hunt Island. After samplings in the vicinity, we started east toward Cape Columbia. Again visibility was poor. The sea ice was much broken, and we had to travel along the steep slopes of the land. Only the most experienced of my partners would drive the machines and komatiks across the steepest slopes. At length, in near white-out conditions, we realized that we were on an ever-narrowing ridge with sides sloping steeply into a gully on one side and onto broken and moving sea ice on the other. I had hoped to reach Alert weather station, but realized that with very uncertain travel by land and definitely dangerous, if not impossible, travel on the sea ice, we had better return to Ward Hunt Island. At one point on the return, as we traveled on the ice foot perhaps a dozen feet wide, between a near-vertical cliff and the sea ice, we had to refuel. That done, one engine refused to start. It defied our best efforts for at least an hour during which time the tide turned. The sea ice began to press in on our narrow ice foot. Ice blocks piled up. The noise was memorable. Ice blocks rose ever higher over our heads as we struggled with the engine. I wondered how long the ice foot could withstand the pressure of the ice of the Arctic Ocean pressing in on it. When the situation began to become worrisome, the reluctant engine started and, without further delay, we left. Dogs would never have loitered at that spot.

A passing Otter aircraft picked us up from Ward Hunt Island and returned us to Resolute from whence my colleagues and the machines returned to Grise Fjord. My samples and I returned to our laboratory for analyses.<sup>(2)</sup>

In retrospect, the difference in travel comfort between dog teams and snowmobiles is negligible. But one could contrast the slow but safe and certain progress with dog teams and the faster but, at times, less safe and uncertain travel by snowmobiles. And in extremis, as others have pointed out, one can eat the dogs. □

(1) *Arctic* 1962 15(4): 317-20

(2) *National Geographic Society Research Reports* 1980 12:113-20



# CU-Boulder Researchers Forecast Record Low 2008 Arctic Sea Ice

*Changes in Arctic sea ice—defined as the area of an ocean covered by at least 15 percent ice—is “one of the more compelling and obvious signs of climate change,” said Drobot. Continued Arctic sea ice declines likely will have negative effects on various types of wildlife, including polar bears, walruses and seals, he said.*

**Terra Daily, Boulder CO (SPX) 2 May 2008, by Staff Writers**—New University of Colorado at Boulder calculations indicate the record low minimum extent of sea ice across the Arctic last September has a three-in-five chance of being shattered again in 2008 because of continued warming temperatures and a preponderance of younger, thinner ice.

The forecast by researchers at CU-Boulder's Colorado Center for Astro-dynamics Research is based on satellite data and temperature records and indicates there is a 59 percent chance the annual minimum sea ice record will be broken this fall for the third time in five years.

Arctic sea ice declined by roughly 10 percent in the past decade, culminating in a record 2007 minimum ice cover of 1.59 million square miles. That broke the 2005 record by 460,000 miles—an area the size of Texas and California combined.

“The current Arctic ice cover is thinner and younger than at any previous time in our recorded history, and this sets the stage for rapid melt and a new record low,” said Research Associate Sheldon Drobot, who leads CCAR's Arctic Regional Ice Forecasting System group in CU-Boulder's aerospace engineering sciences department. Overall, 63 percent of the Arctic ice cover is younger than average,

and only 2 percent is older than average, according to Drobot.

Changes in Arctic sea ice—defined as the area of an ocean covered by at least 15 percent ice—is “one of the more compelling and obvious signs of climate change,” said Drobot. Continued Arctic sea ice declines likely will have negative effects on various types of wildlife, including polar bears, walruses and seals, he said.

For humans, larger ice-free zones in the Arctic region for longer periods offer potential for cheaper and faster merchant shipping between North America and Europe, he said. The declining ice may well open up the Northwest Passage, for example, which runs through the Bering Strait, the Chukchi Sea, the Beaufort Sea and through the Canadian Archipelago to the Atlantic Ocean.

“Based on the current sea ice conditions, aerospace engineering Research Professor Jim Maslanik said the Northern Sea Route—the shipping lane from the Atlantic Ocean to the Pacific Ocean along the Russian coastline—might also open up this summer. “It also is quite possible that extensive ice-free conditions could develop at or near the North Pole,” said Maslanik.

CU-Boulder's Arctic Regional Ice Forecasting System group—the only research group in the world currently making sea-

sonal Arctic sea ice forecasts based on probability—receives funding from the National Science Foundation, the National Oceanic and Atmospheric Administration and NASA.

In January 2008, a team led by Maslanik and involving CCAR's Drobot, Charles Fowler and William Emery, as well as Julien Stroeve of CU-Boulder's Cooperative Institute for Research in Environmental Sciences and NASA's Jay Zwally and Donghui Yi, concluded there had been a nearly complete loss of the oldest, thickest Arctic sea ice. The team calculated that 58 percent of the remaining Arctic sea ice was thin and only two to three years old.

The researchers used passive microwave, visible infrared radar and laser altimeter satellite data from NOAA, NASA and the U.S. Department of Defense, as well as ocean buoys to measure and track sections of sea ice. They developed “signatures” of individual ice sections roughly 15 miles square using their thickness, roughness, snow depth and ridge characteristics, tracking them over the seasons and years as they moved around the Arctic.

Last summer the CCAR Arctic Regional Ice Forecasting System group, which has been making Arctic sea ice forecasts for the past six years, correctly forecast the 2007 record minimum. □

## GENERAL BRAINARD - CONTD FROM P 14

It was not long before a falling out between the disciplinarian Greely and his Second-in-Command, Lieut. Kislingbury, resulted in the latter asking to be relieved of his duty. Thus, Kislingbury's position in the party remained forever in limbo and an ominous shadow crept over the expedition. Brainard even chided himself that September as he wrote privately, ‘It is just five years ago today since I left home to make an ass of myself by joining the regulars.’

By the time the first winter began, however, there were reasons for satisfaction: four depots had been established northward along the coast of Grinnell Land, in preparation for spring sledge journeys. Sgt. Brainard was put in command of the whaleboat for one of these important missions and the depot he established contained 2,000 lbs. of provisions and supplies. Also, new areas of the interior had been mapped in the autumn.

During the winter, a school was established and Lieut. Lockwood edited

and printed the fortnightly news sheet *Arctic Moon*. The writings featured included subjects from the serious to the sentimental and humorous. In spite of these distractions, nobody escaped the psychological stress of the long dark months, even the stalwart Brainard remarked in his journal: ‘One scarcely wonders that [explorer Charles] Hall died. I think the gloom would drive me to suicide in a week.’ □

*The story of General Brainard will be concluded in the January 2009 issue of The Polar Times.*



# Connecting Dots: *Polar Times* editors attend annual meeting of ARCUS

by Cliff Bekkedahl

**A**rctic Research Consortium of the U.S. (ARCUS) held its 2008 annual meeting in Washington, D.C., 13-15 May. These days no one expects good news from D.C., and the ARCUS meeting was no exception. The theme—Tipping Points: The Arctic and Global Change—offered a less-than-subtle hint that the agenda and presentations would provide a sobering analysis of a polar region in peril. And so it was. Many, if not most, of the speakers expressed a belief that the so-called tipping points were not pending or future out year events but rather, most had already occurred and that anticipated changes in their field of expertise were irreversibly under way.

Compounding the gloomy outlook for deterioration of the Arctic eco-system was the conclusion of many participants that reality was outstripping worst-case scenarios and predictions drawn from aggressive modeling regimes.

No surprise, global warming is the engine of change, and it impacts in every dimension of the Arctic environment—the sea surface and below, the surrounding land masses, the indigenous peoples, plants, animals and sea life, weather systems, the physics and chemistry of the region; even the paths of evolutionary processes are being deflected. Indeed, there is little, if anything, in the confines described as Arctic that is not impacted by the gradual warming of the earth.

The speakers on the ARCUS agenda addressed these issues and provided attendees and observers a whole array of dots to be connected which would then

form a larger dot that has to be connected to dots of comparable significance in the world at large. Tim Ragen of the Marine Mammal Commission alluded to this need for connection in a slide that depicted the human population explosion under way, that will take our current count of six billion souls to something like nine billion by 2050. Okay, projections, especially linear projections can be misleading, but there is nothing in view today or on the horizon that would indicate a leveling of population growth, let alone a decrease except in western and developed societies. (Think about that for a moment!)

Population growth is a big dot, and an increasing demand for energy to serve the needs and expectations of  $\pm 9$  billion people is going to connect to the Arctic dot in a big way — and very soon!

Even without explosive population growth, the demand for energy (oil and gas) is accelerating rapidly, and in the Arctic, the prospects for thinning ice coverage and longer summer melts is energizing exploration and technological innovation for deep-water drilling and extraction in all Arctic waters. (See below article on "Bully" drillships.)

Lawson W. Brigham, an APS Director, provided ARCUS attendees an overview of the existing Arctic maritime resources, among which he cited the Russian ice-breaker "battle fleet" as a large, albeit under-utilized, asset but one that may play a significant role in future Arctic maritime activity by virtue of its being there at the right time with experienced personnel.

Be that as it may, Lawson was certain

that economics would be the driver in maritime activity in the Arctic. Yes, shorter voyages for a number of months per year between, say, Atlantic nations and the Far East will be possible through an ice-free Northwest passage, but don't expect a parade of conventional ships being re-routed from traditional sea lanes any time soon. Factors such as safety standards and rules of passage, either by individual or collective action of littoral states, will have to be introduced, and insurers will have to make their risk assessments and determine their rates. Incident to both will be modifications of ships hulls and propulsion systems to prevent or mitigate ice damage. These and other considerations will translate into economic decisions and shape the configuration of resident and passing Arctic maritime resources.

Oil and gas is and will continue to be a large indelible dot in the Arctic array, and it will be connected to the world south of the Arctic circle. How it might be super-imposed and/or crowd out other Arctic dots remains to be seen. For example, a hearty round of applause broke out when the ARCUS moderator announced the 15 May decision declaring the polar bear an endangered specie. Good news but, it is not hard to imagine an unhappy outcome when and if endangered species provisions come into conflict with growing demands for Arctic oil and gas. A looming tipping point? Another reality destined to outstrip models and predictions? We'll soon see and certainly good reason for *The Polar Times* to attend ARCUS 2009. □

## "Bully Drillships"

by Cliff Bekkedahl

**O**il processors are gearing up for major expansion of oil and gas exploration in Arctic waters. Longer summers and the shrinking of the permanent ice cap are opening new possibilities for exploration, and some experts estimate that reserves of oil in the Arctic could reach 400 billion barrels or 30% of the world's remaining supply.

These are technological challenges, foremost a shortage of Arctic-ready drilling rigs. Presently there are only five rigs capable of off shore drilling in waters exceeding 300 feet. This shortage of deep water drilling rigs could extend for as much as fifteen years.

Royal Dutch Shell and Frontier Drilling (Norway) have teamed up to purchase two new build "Bully" drillships (see artist rendition). The first is to be delivered by fourth quarter 2009 and a second ship the second quarter of 2010.

The Bully ship looks like an oil tanker with a derrick on top. The "Bully" design offers a flexible, smaller but highly capable, vessel suited for deepwater and arctic drilling, while reducing the construction and operational costs compared to other deep-water drill ships of similar capacity.

The ship will be capable of drilling with surface blow-out preventers in up to 12,000 ft. water depth. The vessel will feature an ice class hull allowing for safe and efficient operation in arctic conditions and will have Dynamic Positioning (DP-2) capabilities. Through the use of these innovative solu-



tions, the design calls for less crew and fuel. The new drillships have a significantly reduced environmental impact due to lower emissions through reduced fuel consumption, high efficiency/low emission engines and lower steel use for construction. □

See NYT Thurs. 19 June 2008 front page article, "Dearth of Ships Delays Drilling of Offshore Oil" for a global picture of drill ship assets.



# The Aurora — A Most Pleasing and Sublime Spectacle

by Moki Kokoris

Although not many of us have had the privilege of watching the shimmering fires sweep across polar skies, we know that there is something quite magical about the aurora. Still fewer of us understand how and why the lights occur. Throughout the ages—their magnificence and grandeur evoking both awe and fear—people have wondered where they come from, what makes them dance and swirl, and what their meaning could be. As mystifying as aurora legends of distant cultures have been since ancient times, the scientific explanation for the lights is no less awe-inspiring and only adds more intrigue to this phenomenon.



Photo: Brian Jordan/istockphoto.com

So, what are the lights telling us about the mysterious stardust universe in which we live? Researchers around the world have been seeking the answers to this and other questions. They do so with persistence and creativity and even humor. On a building in Poker Flats, Alaska, where the aurora is fervently studied, hangs a sign announcing the purpose of the facility. It states: "Center for the Study of Something which, on the face of it, might seem trivial, but on closer examination takes on Global Significance." The wit of the message aside, let's explore both ends of the spectrum of these geo-

physical dragons that swim through the heavens—the myths and the science.

The aurora is ever present day and night, summer and winter, shaped by our planet's magnetic field, powered by particles from the sun and colored by various gases of the upper atmosphere that create its palette of hues. Seen from outer space, the aurora reveals itself as two broken rings of light that hover over the polar regions of Earth. These haloes which are approximately 4000 kilometers in diameter, cavort at heights ranging between 100 and 1000 kilometers which establishes their lower edge at 10 times the height of a cruising airplane. During the International Geophysical Year in the late 1950s, the Aurora Data Center reported "a wall of light as long as the U.S. is wide, over 100 miles tall with its bottom 60 miles from the ground, moving at 700 miles per hour." The lights appear simultaneously and in near synchrony in both the northern and southern hemispheres; aurora borealis in the Arctic, aurora australis over Antarctica, their performances mainly for the enjoyment of polar bears and penguins.

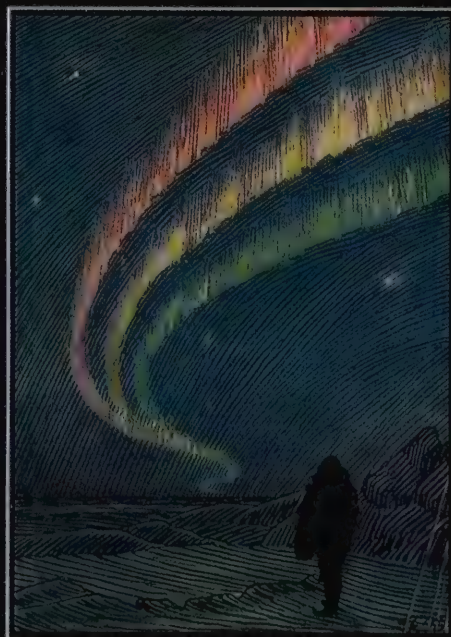
Carl Sagan characterized them as "the most influential error in the history of astronomy, contributing to a detour from reality." Scientists, however, were not the

first to notice the aurora. In addition to early explorers such as Nansen and Cook, ancient people gazed up at the night skies and saw in them ceremonial journeys of angels, departed ancestors, supernatural creatures and children yet unborn. Others saw the lights as harbingers of evil or divine warnings that foretold calamity and bloodshed. Some cultures believed the aurora could be invoked as a healing spirit for their shamans.

Because the aurora can be both wondrous and alien, through countless millennia, our ancestors created their own interpretations of its meaning. The Inuit of Alaska described the lights as the dancing souls of their favorite animals: caribou, seals, salmon and beluga whales. The tribes of Finnmark believed they were "fire foxes" that lit up the sky with sparks that flew from their glistening coats. To the Scots and Swedes they were merry dancers while to the people of the Hebrides they appeared to be shining fairies. The Finns used to say "the women of the North are hovering in the air", and the Saamis of Sweden thought of them as "girls running around the fireplace dragging their pants."

The Chuvash people of central Asia identified the lights as Suratan-tura (birth-giving heaven), the diety called upon to ease women through labor pains. Lakota Sioux thought the lights might be spirits of future generations waiting to be born, and many Japanese honeymooners to this day visit northern Canada believing that children conceived under the spell of the lights will be more fortunate. Fisherman of Scandinavia still look on the lights as an omen of abundance, interpreting them as sunshine reflecting off large schools of herring in the northern seas.

To the many circumpolar indigenous peoples, be it the Inuit of Canada and Greenland, the Saamis of Scandinavia and Russia or the other ethnic groups in Siberia, the northern lights are the souls of those who died through loss of blood, whether in childbirth, by suicide or through murder. Having risen to the frozen snowfields in the night sky, these spirits dash around playing a macabre game of soccer, sometimes using a wal-



Aurora as depicted by Fridtjof Nansen





Image: Bjorn Jorgensen - COURTESY OF PAAL BREKKE

rus skull as the ball.

In the Middle Ages, a brilliant aurora caused total panic among Europeans. It is said that people fainted and went mad at the sight.

Even in the sixteenth century, country residents were so alarmed by these signs of divine displeasure that they poured out of the villages to make penance at major cathedrals.

Stranger still, and left for each of us to contemplate, in January, 1938, the heavens over western Europe were "filled with a strange and terrible crimson fire" that to many presaged the Nazi invasion of Austria three months afterwards. Four years later, violent auroral displays flared over the United States for three consecutive nights, as far south as Cleveland, Ohio, an awful omen, it was said, of Japan's assault on Pearl Harbor.

Such is the supernatural power of the aurora, capable of inspiring delight and dread as well as some of the most fantastic interpretations that take ordinary people to the farthest edges of their beliefs and sanity.

The science behind the aurora is understandably very complex. In very simplified terms, auroral light is produced by a high-vacuum electrical discharge powered by interactions between the Sun and Earth. It is specifically sunspot activity in the form of solar wind (the stream of particles and gas) as well as solar flare

energy releases as they come in contact with Earth's magnetic field that paint the shimmering bands, pulsing ribbons or curtains of color across the sky.

The colors of the aurora result from the solar flare or wind's charged particles coming in contact with various gases at different levels in the Earth's atmosphere. Light yellow-green is most common resulting from oxygen contact at about 60 miles above the Earth. Blue or violet colors appear when the particles come in contact with nitrogen in the atmosphere, while high-altitude oxygen atoms (at about 200 miles) produce rare, all-red auroras.

*(insert second photo from Bjorn here; I will specify which because of the colors!!)*

The number of sunspots (a sign of solar activity) varies according to an eleven-year cycle and strong auroras can sometimes be seen in the continental U.S., particularly in the north during sunspot maximum years (the last one being 2000/2001). Although the aurora is always present, it is not visible during the day nor during the long twilights of summer. Its intensity also varies from night to night, the more vivid displays recurring at 27-day intervals becoming most dramatic around the spring and fall equinoxes. In general, auroras are most spectacular in the hours around midnight.

Active auroras cause magnetic disturbances, namely fluctuations in the Earth's magnetic field that can be felt by sensitive instruments. Even though our magnetosphere protects us from direct effects of the solar wind, auroras can nevertheless seriously disrupt radio communications, radio navigation, some defense-related radar systems, and power transmission lines. Strong magnetic disturbances also create problems with industrial installations in the Arctic. The fluctuat-

ing magnetic fields cause electrical currents to flow through pipes, transmission wires and conductors which leads to corrosion and equipment failure. The magnetic storm in March of 1989 knocked out Hydro Quebec's entire power grid, leaving six million people in darkness for nine hours.

Lastly, but perhaps most significantly, the force of magnetic storms may also affect us much more directly. Some scientists believe that living cells are acutely sensitive to the Earth's magnetic field as well and that even delicate fluctuations may affect such basic biological functions

as metabolic rates, immune response, orientation systems, and sleep/wake cycles. It also appears possible that there are psychopathological effects on human behavior in general as some studies have indicated.

In the 1970s, researchers in the U.S.S.R. published the results of a study in which they found that people are

more likely to have heart attacks—especially fatal ones—under conditions that also produce vigorous auroras. If these correlations are true, it would prove that the living world is indeed "wired" to the auroral circuits and would demonstrate the dynamic link between ourselves and the cosmos beyond.

So, the next time you look toward the Sun, ponder how profound its existence really is. The aurora—whether it appears to us as an enigmatic ancestral dance or a most beautiful night sky painting or a beguiling mystery—it is there to remind us of the Sun's power and significance and to perhaps also stimulate our imagination.

Gratitude is expressed to Paal Brekke of the Norwegian Space Center for his assistance and to Bjorn Jorgensen for his kind permission to use his photographs. □

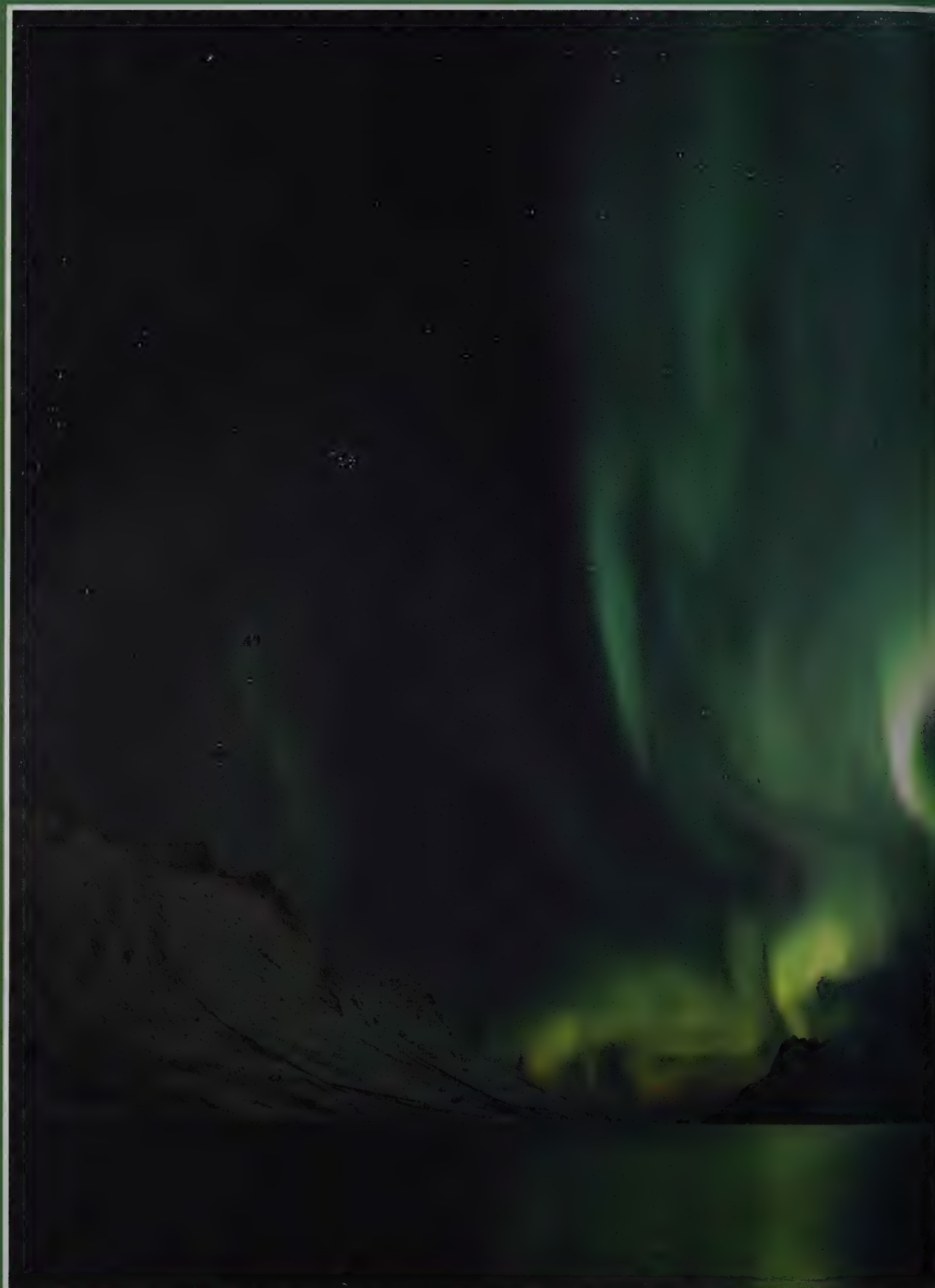


Photo: Bjorn Jorgensen/www.aurora.no



COURTESY OF PAAL BREKKE











## Arctic Summer 1952

by Larry Taylor

For several summers in the early 1950s the U. S. Weather Bureau sought the help of college students in the supply and building of weather stations in the Arctic. Students with an interest in Polar Regions were recruited from colleges and universities mainly in New England. Following my sophomore year at Dartmouth College, in the summer of 1952, I had the opportunity to participate in this program.

The visit to the Arctic at this early stage in my life proved to be the beginning of my career in geology, and specifically a career in glaciology. The experience gave me a great appreciation and love for the polar environment, with its remoteness, its vast unexplored areas, and its unique and delicate ecosystem. Five years later, scientific exploration of the Polar Regions became part of a worldwide program of geophysical research over an 18-month period, July 1, 1957- December 31, 1958. The International Geophysical Year (IGY) involved 70 countries and about 30,000 scientists. An outgrowth of polar research continues today with that substantial funding from the National Science Foundation.

The Cold War was at its height during the early 1950s. At this time the Danish government and the U.S. jointly established a weather station at Thule, northwest Greenland, to serve a B-52 air base under construction at Thule. In addition, the Canadian government and the U.S., from 1947 to 1950, established five weather stations in the Canadian Arctic to provide weather data for long-range forecasting and for polar flights of the B-52s. Stations were located at Alert on Cape Sheridan in northeastern Ellesmere Island, at Eureka on the Fosheim Peninsula in western Ellesmere Island, at Isachsen on western Ellef Ringnes Island, at Mould Bay on Prince Patrick Island, and at Resolute Bay on Cornwallis Island. In 1970 the U.S. withdrew their support of the stations, which are now wholly operated by the Canadian Government.

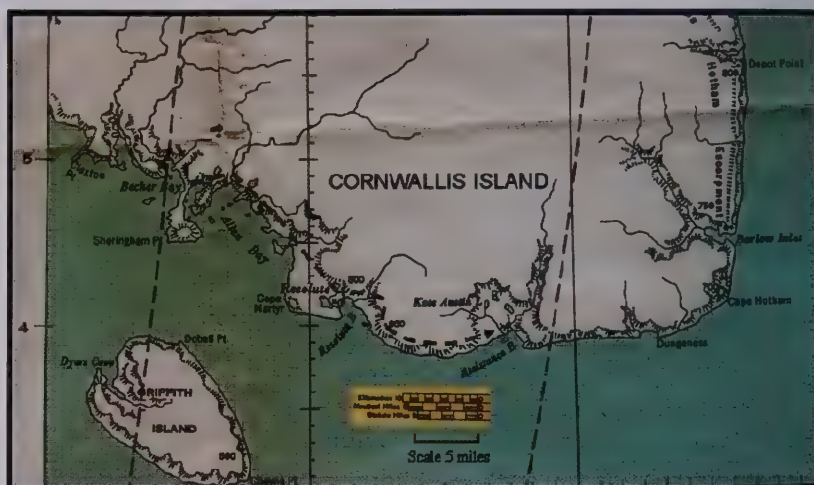
Approximately 22 students were recruited by the U. S. Weather Bureau. The students I remember best were from Dart-

mouth College, Tufts University, and Bowdoin College. John Reid and Parker Calkin

both from Tufts, and I all eventually became glacial geologists. John became a professor of Pleistocene geology at the University of North Dakota. Parker and I met again in grad school at Ohio State University, where we received our Ph.D.s under Richard P. Goldthwait. Parker's thesis area was the Dry Valleys of Antarctica, while my area was Glacier Bay, Alaska. Later we continued as research associates at the Institute of Polar Studies with projects in Antarctica. Finally, I joined the faculty at Albion College and established the Geology Department there, while Parker joined the faculty at the State University of New York at Buffalo.

Another member of our group was Thomas Pickering from Bowdoin, who was interested in foreign affairs. Tom went on to an outstanding career in foreign affairs as U.S. ambassador to El Salvador, the Russian Federation, India, Israel and the United Nations, as well as serving as U.S. Department of State Under Secretary for Political Affairs. The other students included Herbert Drury and Eric Van Schaack from Dartmouth, and Spencer Apollonio and Paul Brinkman from Bowdoin.

As student assistants, we were paid a dollar a day plus travel expenses and subsistence. We worked during the month of June in South Boston harbor inventorying and packing supplies that were to be loaded on the icebreaker USS *Edisto* for transport to the Canadian Stations. In July and August we assisted in construction



and maintenance of the weather station at Thule, Greenland, and at Resolute Bay in the Canadian Arctic.

In early July we departed from Westover Air Base near Holyoke, Massachusetts, by C-54 Military Air Transport with stops at Goose Bay, Labrador, and Bluie West 8 on Sondrestromfjord, Greenland, before landing at Thule. The construction of the air base was called "Operation Blue Jay" and was classified as secret at the time. We flew to Thule with some of the workers, who had no idea of their destination.

While at Thule we lived in a Quonset hut located near the Danish weather station, and ate at a mess hall nearby. The air base was in its early stages of construction. The reverberation of diesel-operated, earth-moving vehicles, accompanied by the smell of diesel fumes, persisted 24 hours a day. In contrast to this, we had the opportunity to visit a nearby Danish village which was a former Eskimo (Inuit) settlement. The Danish government found it necessary to move the Inuits to a site distant from the influence of the air base. Their new location, called Quanaaq (the Far North), is about 75 miles north of Thule.

In addition, we were able to visit the Greenland ice cap at Camp TUTO (Thule Takeoff), where the U.S. Corps of Engineers constructed a road on to the ice using a natural ice ramp. This marked the start of an over-snow trail to Site II, a research station well up on the ice cap, a predecessor to Camp Century. Little did I



# One Japanese Visitor's Senior Moment

by Dave Norton

From early January to late March, groups of tourists arrive in jets chartered from Tokyo to Fairbanks at a time when few other visitors dilute their presence here. The local visitor industry has cultivated an appetite for vacationers to witness the northern lights, or aurora borealis. The odds of seeing auroral displays are best at Fairbanks' Subarctic latitudes, and best during the longer nights between September and March Equinoxes.

Auroral displays vary in intensity, and clouds may obscure them, so tour companies assure winter-vacationers access to alternative attractions. They can go skiing, snowmobiling, dogmushing and even ice-fishing. By some mysterious selection process, these visitors sort plane-loads of about 200 into smaller groups for these more specialized activities. One of my acquaintances guides groups of 6 to 10 Japanese visitors for daylong or overnight excursions over a wilderness trail to a lodge west of Fairbanks, where they engage in various pursuits.

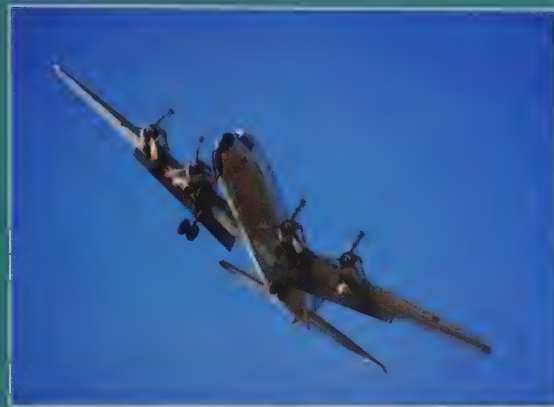
Whatever else they do, these winter visitors tend to shop at least once in Fairbanks' retail stores during their stay. I most often encounter clusters of them on shopping sprees in a Fred Meyer store, for example. They wear distinctive parkas provided them by the tour company organizing their stay. They are polite and studiously unobtrusive, usually circulating in pairs or trios, but rarely interacting with non-Japanese patrons.

On approaching Fred Meyer one March day, I

could see there would be a bustle of Japanese visitors inside. Their bus waited nearby, and tour members crisscrossed the parking lot between store and bus, some with shopping bags in hand.

Still outside the store, a lone, slightly stooped, Japanese gentleman halted in my path, some distance apart from the main flow of foot traffic. Something drew his attention skyward. It couldn't be northern lights in bright afternoon sunlight. His absorption made me pause. He tilted his face upward, with hands clasped behind his back. I soon identified the sound that held his attention. One of the vintage airplanes that regularly carry cargo to outlying roadless communities was on final approach for landing at nearby Fairbanks International Airport. Multi-engine airplanes built 50-60 years ago still fly throughout Alaska. Fairbanksans tend to tune out the roar of piston engines from that pre-jet era. A propeller-driven Douglas DC-6 aircraft soon appeared, wings and fuselage banking steeply down toward us. The Japanese elder followed the clattering DC-6 intently as it descended, looming larger, then finally receding behind trees screening us from the airport's runways.

Our visitor must have been re-hearing a din long ago silenced over his home islands. The re-



*A 4-engine DC-6 airplane banks above, about to land at Fairbanks airport*

play of an aerial ritual from his youth followed. Hundreds of similar aircraft would have flown overhead in Japan for a decade or more following WWII. As his posture resumed its forward tilt, felt privileged to see this elder in reverie, revisiting his past. Not having a camera at hand disappointed me until I learned that Robert Wartenberger, also enchanted by our ancient aircraft, had photographed one on final approach half a year earlier. Despite this interest by visitors, the hospitality industry evidently does not mark aviation flashbacks among Alaska's visitor attractions. □

know that I would be working in this same area in 1954, as field assistant for the U.S. Geological Survey, on a gravity survey of the ice cap. The survey was used to determine ice thickness and to identify areas susceptible to crevassing. The survey was helpful to the Corps of Engineers in marking a safe trail to Site II. I would return to Thule in 1957, to participate in a survey of a permanently-frozen lake that could be used as an emergency landing site northwest of Thule.

In early August we were transported by the Navy ship USS *Wyandot* from Thule to the Resolute Bay weather station on Cornwallis Island. The *Wyandot* was an attack transport, AKA 92, converted to a supply ship for use in Polar Regions. Our trip was a 1,550-mile four-day trip through open water dotted with icebergs. It was late enough in the season so that the transport ship with reinforced hull did not have to breach ice floes. On board the ship we got a glimpse of Navy life, and the working shipboard routine. We were awakened with "Now hear this!

Now hear this! – Reveille! – Reveille! – Reveille! – heave out and trice up!"

We remained several weeks at Resolute Bay. As at Thule, a Quonset hut, located near the weather station, served as our quarters, and we ate meals at a mess hall near the station. Our work followed the usual routine of unpacking supplies, painting, carpentry, etc. One challenging task we faced was to bury large anchors in the permafrost. The anchors were attached to cables that were to support tall radio towers. Deep holes had to be dug into solid ice in stages, six inches down each day, allowing a day for the newly exposed ice to thaw. When the anchors finally were buried, the soil eventually froze solid around them.

Sometime in early August, soon after our arrival, Canadian authorities made an amazing discovery at Assistance Bay about 10 miles east of Resolute. They found a cairn with some supplies and a note, dated August 1851, left by Captain William Penny. The note was discovered exactly 101 years ago to the day that it was

written. The British captain and his crew wintered over at this site while searching for the lost Franklin expedition.

Sir John Franklin set out from England in 1845 in search of the Northwest Passage, but he and his entire crew perished. Penny found traces of Franklin's winter quarters (winter of 1845-46) on Beechey Island, a small island off the southwest coast of Devon Island, 25 miles east of Cornwallis Island. Wooden headstones on Beechey Island mark the graves of three of Franklin's sailors. The bodies are well preserved in permafrost, and autopsies in 1984 and 1986 revealed high levels of lead poisoning. It is believed that the men's canned food was contaminated from the lead solder used in sealing the tin cans. Most investigators believe that this caused the expedition's mass demise. Other bodies and pieces of equipment were found scattered about the Canadian Arctic.

In 1952, only weeks after the discovery of the Penny's site at Assistance Bay, our

*CONTINUED ON P. 24*



group was allowed to visit it. We spent a long day hiking to the bay. The cairn was there, but of course Captain Penny's artifacts had been removed and, as far as I know, reside in a museum in Ottawa. It was exciting to witness an important part of the history of Arctic exploration, and to be part of the first group to visit the site following its discovery!

While we were at Resolute, we had the great good fortune to meet an expedition of Canadian geologists including Ray Thorsteinsson. They stopped for supplies after traveling by large motorized canoes from Devon Island. They unloaded big chests of fossils and carried them up to our Quonset hut. The group of bedraggled and bearded geologists resembled pirates unloading their booty! The chests contained slabs of shale with beautifully preserved three-dimensional graptolites. We were told that these were the finest such fossils found anywhere in the world. My knowledge of geology at the time was limited to an introductory course, but I could see we were witnessing a special event involving new discoveries from a geologically unexplored land. The rocks on Cornwallis Island, we were told, were Ordovician to Silurian in age, about 400 million years old.

During one of our hikes, a mile or two from the weather station, I discovered the remains of a slaughtered seal in the vicinity of an abandoned Eskimo stone house ring. Blood was oozing from the carcass. There were dried bones strewn about. One fragment appeared to be a curved plate-like piece of bone with a hole drilled in one corner. I reported the find to the Canadian authorities. To their astonishment the radiocarbon dating of the carcass was about 600 years! The slaughtered seal with blood intact had been lying preserved in permafrost for that length of time. The house ring belonged to a Dorset Eskimo hunting camp of that period! It was their custom to build temporary shelters with walls of stone and a roof of animal skins. Years later, while working with a Dartmouth College group at Angiussaq Lake north of Thule, we discovered similar house rings belonging to ancient Thule Eskimos.

Another bizarre incident involved Herb Drury, one of the Dartmouth student assistants. He volunteered to assist a naturalist

Bob Jasse on a trip to Intrepid Bay to film birds. According to Herb, they were some 50 miles out from the base near the north shore of Cornwallis Island when they encountered a single bull musk ox. They approached cautiously and started filming about 10 yards away. While Bob operated the movie camera, Herb stood by with a rifle. Suddenly the musk ox careened toward Bob, who had no idea he was being charged because the bull would not focus in the viewfinder as it moved toward him. A rifle shot was fired and the musk ox collapsed within feet of the cameraman. As it is illegal to kill musk oxen, the Canadian authorities had to determine if "self protection" justified the killing. I did not hear of the final ruling.

In late August 1952, after completing our work on Cornwallis Island, Tom



Pickering and I were allowed to remain an additional week, while other students returned to the States. The authorities gave us permission to hike northwest along the island's coast toward Claxton Point, about 30 miles away. We set forth with backpacks loaded with C-rations, a primus stove, cooking gear, a tent, sleeping bags, and a 30-06 rifle for protection against polar bears.

At this time the island was not fully explored, and we believed that we were the first humans setting foot on that part of the island. It was a very hard trek, over rolling terrain covered with angular

fossil-bearing limestone and sandstone fragments, with broad patches of mosses, grasses, and some Arctic flowers. The first snow of the season left patches of white on the brown rocks and soil, in contrast with the light blue sky and dark blue waters of Barrow Strait to the south.

We saw very little wildlife, mainly Arctic terns, snow buntings, and waterfowl too distant to identify. Seals and sea lions could be seen off shore on ice floes. Musk oxen and polar bears were present on the island, but fortunately we didn't encounter them. After hearing of Herb Drury's experience with a musk ox, and having heard of the mauling of a weather station man by a polar bear, we were happy to keep our distance from these animals.

While camping near the shore we were awakened one morning by a loud honking and bellowing noise that sounded like traffic grid-locked on a crowded city street. We sat up in our sleeping bags and to our great joy could see ice floes in the distant bay covered with hundreds of brown, lumbering sea lions!

We built a cairn marking the farthest point of our trek on the far side of Sheringham Point overlooking Becher Bay. Again, we were probably the first humans to set foot on this part of the island. I am sure occasional Eskimo hunting parties ventured along the shore, but not inland. Other than the weather station 30 miles to the southeast, the nearest civilization was at Thule, 1,400 miles east-northeast of us, or Churchill on Hudson Bay, nearly 2,500 miles due south!

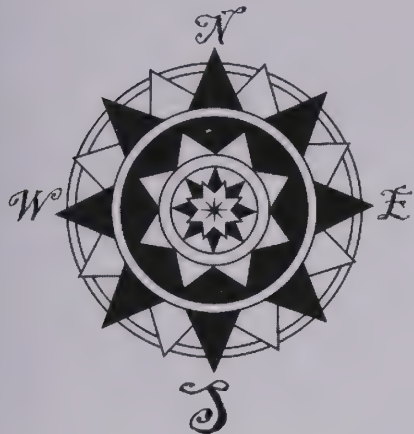
"Nicky," a local dog from the weather station, followed us all the way and was a wonderful companion.

But the trek was "Nicky," a local dog from the weather station, followed us all the way and was a wonderful companion. But the trek was hard on her feet, which became bloody. Tom set a good pace, and upon our return four days later, my feet were blistered and aching.

In late August, we were flown to Ottawa by Canadian Northstar aircraft, with a stop at Churchill on Hudson Bay. From Ottawa Tom and I, bearing a sign "from the Arctic to New Jersey," hitchhiked to our respective homes in Rutherford and East Orange. I arrived in a tired but very excited state, and awakened my parents in the early morning hours. □



# Due North



by Arctic Contributing Editors  
Herbert R. Drury and Moki Kokoris

**MOKI:** There is no doubt that many of you have experienced this affliction at one time or another in your lives—the shakes, the chills, those peculiar sensations deep inside your gut—all of which are collective indications that you have contracted “the virus”. It is known as infectious *polarphiliosis*. Depending on its severity, the disorder compels its victims to seek group therapy treatment, or, worse, it can interfere with and even impede good judgment. Even though I did partake of two such group therapy sessions recently in the form of polar conferences, I must confess that my own *polarphiliosis* is far from remission.

Shortly on the heels of participating in the two-week Permanent Forum on Indigenous Issues (PFII) at the United Nations, the theme of which was climate change, I traveled to Washington DC to attend the ARCUS 20<sup>th</sup> Annual Meeting & Arctic Forum 2008, and then to Philadelphia for the “North by Degree” conference, its focus being Arctic exploration in the 1850-1940 period. Because our illustrious Editor-in-Chief, Cliff, was in attendance at the ARCUS meeting (albeit not as a patient, I assure you), and since there is mention of it elsewhere in this issue, I will briefly turn my attention to the second conference, which was perhaps even more interesting.

I intend to write a more detailed article about the “North by Degree” conference in order to do it proper justice because there is much to describe. In synopsis: hosted by The Academy of Natural Sciences, American Philosophical Society, The

Peary-MacMillan Arctic Museum and Arctic Studies Center at Bowdoin College, and the Philadelphia Area Center for the History of Science, the sessions focused on such topics as strategic issues propelling Northern exploration; consequences of culture contact (Western-Inuit); the impact of Arctic exploration on popular culture; national identity and “Race for the Pole”; increases in knowledge of the natural world; advances in maritime technology; changes in navigational techniques; advances in travel and communication technologies; and the culture of the explorer. Believe me, each of these deserves more elaborate mention which I will save for the future.

However, to return to the topic of my disease, allow me a slight deviation of a lighter nature. Given my particular interests in the field of climate change and my personal inclinations toward all things Arctic and indigenous as they relate to circumpolar regions, the United Nation’s PFII was especially fascinating to me. The conference’s opening session was most intriguing of all because I found myself surrounded by representatives of hundreds of aboriginal tribes from all over the globe. There were feathered headdresses, necklaces of coins and bells, beaded garments, and embroidered sarongs of all types. But before the first session was to begin, my polar crosshairs caught sight of a man wearing a sealskin vest. I know enough about native clothing to have been able to identify him as an Inuit, and my laseresque gaze followed him until the perfect moment to seek a brief audience with him. Aha, but this was also the precise moment when the symptoms of my aforementioned disease chose to rear their heads. They came on suddenly and without any warning.

Instead of acting as the professional diplomat that I am, I chose to be humorous. With my checkbook in hand, I approached this sealskin-clad gentleman and asked, “So (wink-wink), how much for the vest?” The grin on his face illuminated the room as he asked me for my business card. Upon honoring his request, with a heavy accent he said, “Good. Now I know how to spell your name. When I prepare my Will & Testament, I’ll make certain that you get the vest after I die.” After hearty laughter and a little small talk between us (while I unabashedly continued to admire and fondle the edge of his vest), he politely excused himself because it was time

for everyone to take their places.

Seated on the floor of the United Nations Assembly Hall were ambassadors and ministers and representatives from various nations. At the front at the elevated podium sat other dignitaries who had been invited to be the honored speakers. After a soulful and moving performance by a didgeridoo player from Australia with which the proceedings began,

this is when the side-effects of my affliction became patently clear. Among representatives of the UN Secretariat and even presidents of countries, at the podium sat the very man with whom I had connected in my comic-relief sort of way only minutes earlier. Little beads of my personally indigenous sweat appeared on my forehead as he—in his sealskin vest—was introduced as the President of the Inuit Circumpolar Conference of Greenland. THE PRESIDENT! Not only that, but on his résumé appear other teensie bullets such as Member of Greenland Homerule Government and Minister of Social Affairs. And I solicited this President with a checkbook and a smile? Be still, my heart! Where is that hole in the floor when you need one?

However, not all of my embarrassment was for naught because Mr. Aqqaluk Lynge (who incidentally almost never appears anywhere without his furry vest) walked up to me at the end of the session with a book he had authored, signed and personalized, and with another luminous smile and decided twinkle in his eye he added, “You made the most entertaining introduction I have ever received, and for this book which is my gift to you, you will not have to wait for me to die. Oh, and by the way, my vest is not just a piece of clothing. It has become a political statement - a symbol of our Inuit human rights. This vest shows who we are, what we value, what we stand for, and even how we intend to make our way in the world.”

For those of you who do not know, Greenland is attempting to follow in the footsteps of Nunavut which is now Canada’s largest and newest territory and which was officially separated from the Northwest Territories only a few years ago. Although Greenland is currently a self-governing Danish province, it is heavily considering greater sovereignty and even autonomy.

Sealskin vests notwithstanding, how much for that doggie in the window?



For anyone interested in watching a British interview with Aqqaq (and to see this infamous vest), please go to <<http://www.youtube.com/watch?v=39Od5uWiuel>>. □

**HERB:** Wow! There's so much going on in the Polar Regions that it's hard to know where to begin! Most, but not all of it, revolves around global warming issues in one way or another. First, let me list just a few of the latest items from my desk, computer, TV, and various publications, almost all of which contain information on polar activities or socioeconomic reactions thereto in many different forms.

Number one, perhaps, is the recent opening of the so-called "Doomsday Vault" on one of the islands of Spitzbergen, also known as Svalbard, well off the coast of Norway, the country that owns them. This is a concerted effort by many cooperating agencies worldwide to collect and preserve, far into the future, the seeds of as many species and varieties of the earth's flora, vegetation, and crops as can be found anywhere. The idea is based upon the fact that thousands of plant types have already gone extinct, or are on the verge of doing just that. Most of us know little or nothing of this phenomenon unless we are directly involved in some form of work with trees, flowers or farming, and even then may not have even heard of this movement. The idea is to preserve for all future generations, every possible form of plant life in environmentally controlled vaults in a place unlikely to be subject to catastrophic disasters, so those organisms will be available virtually forever. Norway's group of large islands between the Greenland and Barents Sea areas of the Arctic Ocean, is roughly half way between north Norway and northern Greenland near the eightieth parallel. So it is very well situated in about as remote a location as one could imagine. Thus, it was the choice of botanists in-the-know who felt we may someday need any one of these plant species or forms for any number of possible uses down the road well into the future.

Next comes a myriad of projects going on in both Polar Regions wherein various groups or individuals are attempting scientific explorations or other projects on land, sea, and ice. Some of them are hooked up to satellite systems so the ad-

ventures and findings of their participants can be broadcast directly to educational institutions all over the world, including several in America. Two of these involve young ladies aboard ice breakers near both poles who radio back their adventures to schoolchildren, some even in live format. Others involve more young ladies and men on skis upon over-ice trips to the North Pole or on expeditions to find the most northerly bit of land on earth, among other things. The modern trend to communicate daily with people, pupils, or pundits back home is, in itself, an indication of what is happening almost globally that was virtually inconceivable just a few years ago.

Our world is awakening to the fact that what happens in the Polar Regions actually affects all of us. The rapid melting of ice, including breakups of whole ice islands, not only there but also in glaciers of Austria, Alaska, Montana, South America and elsewhere, is having major effects upon people in many parts of the world far beyond the poles. I hear almost daily of events going on in distant regions of the world related to global warming in one form or another that a lot of folks never expected to happen in their area. Whether mankind is, at least in part, causing some of the destruction and grief occurring in so many places may still be undecided by certain vocal critics like Dr. Fred Singer, former Director of the U.S. Satellite Service, among others. And how much all of this is related to politics versus true science is still very much in doubt. But the fact remains that things are changing on old 'Mother Earth', some of them much faster or more violently than expected. And not just ice problems are being investigated, but such things as the famous Aurora Borealis or Northern Lights are being studied in Fairbanks, Alaska to see if they are having negative effects upon satellites, pipelines, or other objects through electro-chemical or other actions.

Just my list of items related to polar activities, films, programs, or conferences and such, or stateside reactions to the increasingly popular 'going green' movements to measure one's 'carbon footprint', or reduce energy consumption and the like, already exceeds three pages! A limited selection of these that include recent TV shows, books, or publications relative to climate or human events are: 1)

The Weather Channel and "Animal Planet" series on wildlife; 2) "Sixty Minutes" show on 12/30/07 about super-hot forest fires in our West related to one degree of global warming in the past fifteen years or so; 3) National and state Audubon Societies, National Geographic, Aspen Institute and others having conferences on wildlife, climate, the environment, global warming, and all sorts of related subjects; 4) newspaper and magazine ads for any number of 'green' or 'going green' products, devices, or schemes to reduce the output of so-called 'greenhouse gases' (mostly carbon dioxide); 4) "You Tube" on the web listing dozens of films or other programs related to the Arctic, wildlife, toxic chemicals, climate, human activities, etc., etc. The list goes on and on, and there appears to be no end in sight. People everywhere are getting on the 'bandwagon' of environmental education or action, it seems, now much more than ever before. Not all of it may be good, of course, since there are always those who try to take advantage of any situation for personal gain, be it legal or not. But generally speaking, Americans and others everywhere are finally waking up to the fact that things are not all that great in our natural world, and it's time we began doing things to help. We are, indeed, now starting to move in that direction 'en masse'! Just how much we can do, or how effective any or all these new programs are, or will be, is anyone's guess. But at least we are no longer ignoring our planet, and are doing something about it in a degree never imagined in the days of the early polar explorers.

Some publications relative to all this have come to my attention lately.

Although "Polar Times" may not have reviewed them per se, they shed a lot of scientific light on earth history that gives clues to the current trend in climate changes. The first is "The Ice Chronicles, the Quest to Understand Global Climate Change", by Paul Andrew Mayewski and Frank White, University Press of New England, 2002. This one tells of drilling through the central Greenland ice cap 10,018 feet to bedrock in July of 1993. It is of particular interest to me because when I was at Camp Century, 140 miles out on the northern Greenland ice cap in late 1960, the Army Engineers there were working on developing just such a drill to melt its way through the ice and bring up



solid cores for scientific analysis. Similar efforts were later performed in the Antarctic, and the findings from these and other ice coring efforts have given us a visual and chemical history of the earth much like that of geological rock formations and tree rings. We now have actual records of atmospheric and temperature changes of several earth regions going back for literally hundreds of thousands of years. At least two other college friends were involved in the McMurdo area drilling or inventing the system for extracting carbon dioxide and other gases from the resulting ice cores. Some of those cores may be stored in the refrigerated rooms of the Cold Regions Research and Engineering Laboratories in Hanover, N.H. where I once hunted woodchucks as a boy before becoming a biologist.

The second book I recently received is called "Frozen Earth, the Once and Future Story of Ice Ages", by Doug Macdougall, University of California Press, 2006. It is a compendium of information on earth history as depicted in ice and its fluctuations over eons of time. Much of the evidence for the several different ice ages, both major and minor in degree, that have occurred over many centuries on earth is clearly explained here, and a lot of it comes from ice cores now stored in several locations worldwide. Al Gore's documentary film, "An Inconvenient Truth" begins very appropriately with findings gleaned from ice as well as other sources, both geological and organic. The two books together make a strong case for natural fluctuations in earth climate, temperatures, and the varied effects thereof. So we know that cycles of warming and cooling of the earth have gone on throughout the world's history, but much new evidence seems to indicate that the latest warming trend is faster than normal. I am not one to judge the growing amount of information that may indicate human influences on these phenomena. I will leave that to those on the leading edges of scientific research. Each of us must then decide for ourselves whether we want to join in trying to slow down the alleged 'global warming' in whatever ways appeal to us in the near future in hopes of affecting the long run favorably.

Last, but not least, is the inclusion in this issue of contributions of two former colleagues of mine from our first northern

exposure together back in 1952 at Thule, Greenland and Resolute Bay, N.W.T., Canada. All three of us were members of a group of student assistants hired by the U.S. Weather Bureau to work in the Arctic during early years of the 'Cold War'. We helped relocate weather forecasting facilities from Denmark's northern Greenland to the Canadian arctic islands where our three countries had, or were developing, jointly operated bases to combat any possible Soviet invasion. Dr. Lawrence D. Taylor, still a student at Dartmouth College from which I had just graduated, and Spencer Apollonio of Bowdoin College in Maine, an institution renowned for the arctic explorations of Donald B. MacMillan in those times, were among several others recruited largely from eastern institutes of higher learning.

Dr. Taylor went on to become a geologist, now retired, and founded the Department of Geological Sciences at Albion College in Albion, Michigan. He devoted his life to science, and over ten years of it particularly to arctic and Antarctic research, including traverses across that southern continent. He has graciously submitted his account of that summer we all shared, which appears elsewhere in these pages. So I will not write up my own account of those career defining days, but will try later to contribute my version of a side trip on Cornwallis Island in the Queen Elizabeth Islands of northern Canada that another young polar enthusiast and I took to Intrepid Bay that summer.

Spencer Apollonio, our fellow worker from Maine, went on to lead his own expeditions to Devon Island in that same area in subsequent years. Unfortunately, I was unable to join him in those endeavors as I was already raising a family in graduate school where I became involved with the musk ox that led to last summer's article in the "Polar Times". He was kind enough to send us a story, also in this issue, about a journey by sledge and snow machine from Devon Island to Ellesmere Island wherein he compares travel by native means to more modern ones. Sometime later 'Spence' became Commissioner of Marine Resources for the state of Maine, and now resides in

Boothbay Harbor, out of which Captain David 'Beany' Nutt of Dartmouth used to do oceanographic research with other college classmates of mine on his schooner, "The Blue Dolphin". I am still trying to contact several other contemporaries who did time in the Polar Regions in hopes of gleaning more stories of interest to readers of the "Polar Times". Unfortunately I am already too late for some former arctic veterans who have left us permanently. But please stay tuned as I am hopeful that at least a few 'survivors' of that era will supply us with more such 'ammunition' before it is lost forever.

Lastly, I am recently in receipt of one such previously published article, thanks to a former schoolmate who spent her 'honeymoon year' at Barrow, Alaska with her young doctor husband of two weeks back in 1958. Dr. Michael Halberstam of New York City, brother of David Halberstam, a well known author, and his wife, Linda Brackett, were sent by the Public Health Service to that remote community some 350 miles above the Arctic Circle. Their adventure involved working with and doctoring Eskimos living there in wooden houses instead of snow igloos. They were able to see first hand the mix of old and new customs of an ancient people 'going modern' even then. Things have changed greatly since that time, and continue to do so at an even faster rate these days in the cold regions. And the infamous polar bear, symbol of the Arctic, has finally made it onto the "Threatened Species" list as of May 15, 2008! □





# Everything You Always Wanted to Know About Saamis (and Coffee) But Were Afraid to Ask

by Moki Kokoris

ILLUSTRATION BY: AAKE GUSTAVSSON



Despite its perception by outsiders as a barren and inhospitable wilderness, and depending on how the boundaries of the region are defined, the Arctic is home to approximately 4 million inhabitants - roughly one tenth of which consists of a diverse number of indigenous peoples spread across the Arctic territories of Alaska, Canada, Greenland, northern Scandinavia and Siberia. In Alaska, these peoples are known as Iñupiaq and Yup'ik Inuit, Alutiq (Aleuts) and Athapaskans; across Canada, Nunavut and Greenland, they are Inuit; in Scandinavia, the native people are the Saami; while in Siberia, there are as many as 40 different ethnic groups, the Nenets, Yakuts, Chukchis and Dolgans among those.

In general, the region is sparsely populated, with densities averaging fewer than 1 person per square mile. In spite of tremendous social, demographic, and technological changes in modern times, Arctic cultures nevertheless remain vital and resilient, with many small nomadic communities that are closely linked to native wildlife and local natural resources still continuing to follow a traditional way of life.

In this first installment in a series of articles about the indigenous peoples of the Far North, we shall concentrate on the Saamis who have inhabited the northern regions of Fenno-Scandinavia and Russia for at least 2500 years. With the exception of the groups that settled near the coasts, the Saamis generally lead a semi-nomadic or nomadic lifestyle determined

by the migrations of the reindeer.

Lapland, more currently referred to as Finnmark or Sápmi, is not a country but a region that stretches across the borders of Sweden, Norway, Finland and northern Russia. From the times of the Greek explorer, Pytheas, who first mentioned it in 300 B.C., this area of land had been given many names, most of which were strange to the Saamis. These included Thule, Ultima Thule, Fennia, Scritfinnia, Finnamarchia and Lappia. Today, the Saami people themselves use the word Sápmi.

Since the earliest years of the Christian era, wondrous rumors of a barbaric people in the farthest North spread as far as Rome. In 98 A.D. Tacitus chronicled that far beyond the Germanic tribes lived the Fenni who had no possessions and were completely wild. They had neither horses nor houses, they were clad in animal hides, they did not cultivate the land but ate only what they could find growing wild, and their beds were the bare ground. Their only protection against wild beasts and weather was a primitive hut made of sticks and skins. They had no iron, and instead tipped their arrows with bone. Thus armed, they went hunting, and women hunted with the men and took their share of the kill.

Later ethnographical and archaeological field investigation proved that much of what appeared fantastic to the readers of the ancient writers had some basis in truth, and facts about what had been for a primitive

people in this Hyperborean land an existence governed by practical necessity gradually emerged from the world of fable and myth into the light of history.

Although their territory is intersected by four national boundaries, most Saamis speak the same basic Finno-Ugrian language with up to fifty dialects spread over the wide area. Their costumes are also similar throughout a large part of the region with distinct variations mainly in ornamentation and embroidery and hats, which by their patterns and shapes indicate the specific area they are from and even the individual's marital status.

By and large, the Saamis are divided into three groups according to their occupation and location: the coast-Saamis, the forest-Saamis and the mountain-Saamis. The coastal group is the most numerous and has never been known for reindeer breeding, choosing instead to settle in turf-huts along the shores of the Arctic Ocean. They are trappers and fishermen, boat builders and skilled weavers. The for-



ILLUSTRATION: J.A. FRIIS, 1867



est-Saamis are regarded as half-nomads, basing their existence on the forest reindeer which remain in the forests throughout the year, moving to higher ground only in the summer. These Saamis migrate between permanent timber huts and their winter camps where they live in tents. The mountain-Saamis, who are regarded as being wholly nomadic follow their reindeer herds between the forests of the Gulf of Bothnia in the winter, the eastern foothills of the mountain range in spring and autumn, and the higher mountains of the northern sea coasts in the summer – all in a regular, annual rhythm. They live in relatively easily transported nomad tents through the entire year.

As can be expected, the Saami diet depends highly on which group they belong to, but consists predominantly of reindeer meat, reindeer milk, butter and cheese, fish, and various native berries. Grains and other items that cannot be cultivated are purchased at regional markets a few times a year. One such staple that few Saamis can live without is... coffee!

Coffee has had a long-established place in the lives of Saami folk for well over 100 years in most parts of Sápmi, and many customs flourished around its use. The Saami people probably had their first experiences with coffee from sources in Sweden, where it had been first imported after 1680. By the early 1700s coffee houses were established in Stockholm, and it is believed that coffee finally reached Sápmi's coastal communities by 1750.

Customarily, coffee was prepared by the man of the household, perhaps because he was also responsible for the cooking of the meat. In the earliest years of its use, preparing coffee was, like the meat, a difficult task to prepare. By 1900, however, women had taken on the task

and it became a companion duty to bread making.

Early on, coffee beans were purchased in unroasted form. The roasting process required constant stirring of the beans over the heat so it was a time-consuming task to keep a supply at the rate that coffee was consumed – often three or four cups per person per sitting. Migratory folk roasted a large supply during the winter before leaving for winter pasture, and in summers roasted it as needed in smaller amounts. A large frying pan was the utensil of choice for the roasting process, and apparently from the very beginning, Saamis liked their coffee roasted strong, stirring it until the beans were appropriately coal black.

Coffee was freshly ground for each pot, although herdsmen usually took along preground coffee. The earlier grinding was done with a stone on another flat or concave stone. Some grinding was done in a hollowed-out log using a stick as the pestle. Still a third method was to place the roasted beans in a skin bag and strike the bag with a stick until the grounds were suitably fine.

Early techniques for brewing coffee appear to be common across Sápmi, too, the process beginning by soaking the crudely ground beans in cold water which was then brought to a boil. After boiling, the pot was placed beside the fire to steep. As a result of the crude roasting and grinding methods, the brewed coffee was very murky and needed to be cleared before drinking. Clarifying coffee the Saami way required putting a dried pike skin into the pot. The slime from the fish skin picked up the floating grounds and carried them to the bottom of the pot as it sank.

Although sweetening coffee is gaining popularity these days, Saamis still enjoy a sprinkling of salt in their brew, and in northern Sweden, it has been known for Saamis to float reindeer feta cheese in their cups à la marshmallows in a mug of hot chocolate. (Let's see Starbucks try that!)

It is no surprise that superstitions around the use of this most-favored beverage would evolve over time, and many of these commonly held beliefs remain to this very day—some of the more peculiar and amusing ones being:

- When the coffee is ready, one must



Mori Koronis - Jukkasjärvi, Sweden, 1999

pour for oneself first or it will spoil the family's best driving reindeer.

- When cooking coffee, see to it that the coffee pot does not rock where it hangs, or surely you will rock away your belongings and end up in poverty.
  - When one throws the coffee grounds away, take care not to throw them outward but towards oneself. Coffee grounds, bones and other waste must be thrown towards oneself or there is a risk of throwing away happiness.
  - If there is foam on the coffee, the direction in which it floats will show who the recipient of money or a gift will be. If the drinker is alone and the foam floats away, it is an indication that the drinker will have many debts.
  - If one spills coffee, guests will arrive who are thirsty for coffee. If coffee is spilled twice, count on receiving intoxicated guests.
  - When the coffee pot hanging over the fire turns by itself and there is an unmarried boy or girl present, he or she will marry the first guest of the opposite gender.
  - If an unmarried person receives a refill before the first cup is entirely finished, one risks getting a nasty mother-in-law.
- Who knew? ☐

*Editor's Note: Stay tuned for the next episode in the continuing saga of "As the Indigenous World Turns" in which we shall present the facts and myths and other interesting morsels about the people who inhabit the Far North. The second installment will focus on the Dolgans of Siberia, where the woolly mammoths once roamed. We'll take you deep into the ice tunnels beneath the tundra where the bones and tusks of creatures that lived during the last Ice Age are "secretly" stored.*



Mori Koronis - Jukkasjärvi, Sweden, 1999



# Notes on Traveling Independently in Northern North America

Story and photos by Robert Würtenberger



The author on a farm on Cortes Island, B.C.

(Editor's comments: High-latitude tourism has become a recurrent theme in recent issues of The Polar Times. The following is a contribution that continues the series on Arctic tourism that began in the January 2007 issue. In the first articles of this series, former Arctic Editor Dave Norton distinguished sharply between package tourism and independent or "off the beaten track" travel. Travelling independently is impossible in Antarctica, and quite challenging even in the Northern Hemisphere, as this article documents.)

Travelling through Canada is a dream shared widely among my young German countrymen. Year after year, however, money and free time for such travel remained in short supply for me. Upon my 30<sup>th</sup> birthday in 2006, I resolved to get serious about making this trip. Visiting a travel agent soon convinced me of two things. First, to stay within my budget while travelling in North America, I would have to avoid package tours. Second, it was already too late to do both the independent planning and the travelling in 2006.



White Pass and Yukon Railway, descending toward Skagway, Alaska.

To allow enough time to explore northern North America cost-effectively in 2007, I arranged with my employer to combine 35 days of unpaid leave with 30 workdays of normal paid vacation. The combination allowed me nearly three calendar months of absence from work. That seemed like plenty of time. I roughly plotted highlights of my destinations: Stuttgart to Anchorage; Denali Park, and Fairbanks, Alaska, then to Vancouver BC, to the east coast including Nova Scotia, Newfoundland, back west to Toronto for the return flight to Germany. Between arriving in Anchorage in August and departing from Toronto in November, surface travel by rail or bus would allow me to control expenses and keep my itinerary flexible for unplanned opportunities. For the same reasons, hostels and bed and breakfast (B & B) lodgings would have to take the place of hotels at stops along the way.

The 21<sup>st</sup> of August 2007 turned into the longest day of my life. Several jet airliners at these high latitudes carried me westward nearly as fast as the Earth rotates west-to-east in relation to the sun. Stuttgart-London-Chicago-Anchorage required 26 hours of elapsed time since I left Germany, yet it was still the 21<sup>st</sup> of August in Anchorage! That long series of flights left me numb, but it had been my cheapest option. The only North American reservations for lodging that I had made from Germany were for a B & B in Anchorage and another outside Denali National Park a few days

later. I had learned on the Internet that Anchorage and the Park were likely still to be crowded through August. After those first few nights, I would have to live by my wits, and rely on my classroom English for the next three months in North America.

Anchorage proved rainier and cooler than ideal for an independent traveller. For a first-time visitor from Europe, the new and different cultural exposure was overwhelming. After a day of walking through Anchorage, I was glad that the



Top Dalton Highway to Prudhoe Bay as it crosses tundra on Alaska's North Slope.

B & B owner connected me with a German immigrant acquaintance of his, who showed me around.

Next came the Alaska Railroad trip from Anchorage to Denali National Park. In the Park, instead of a flightseeing tour to Mount McKinley, I chose to take a far less expensive shuttle bus tour out and back on the Park road. Low-budget travelling often requires making such choices.

Upon arriving in Fairbanks by train, I found accommodation at my first North American youth hostel. Through Skype on the Internet from Germany, I had befriended Dave Norton of Fairbanks. He took me to a number of interesting places in and around Fairbanks by car or in his riverboat. Late August weather in Fairbanks remained warm and sunny. As interesting opportunities and activities kept arising, my stay in Fairbanks extended well beyond the two or three days that I had expected to stay. Before



heading east to Whitehorse, I had spent two days (of 10 in Fairbanks) riding as an observer on a tractor trailer truck hauling freight up the Dalton Highway, 800 km (500 miles) to the Arctic oilfields at Prudhoe Bay. Dave Norton arranged my side trip on this challenging and scenic stretch of road with Carlile Enterprises, a trucking company that hosts teamsters from other countries like me, on an exchange-of-courtesy basis. The Prudhoe Bay Hotel was the only available lodging at the turnaround point. One night there cost the equivalent of 3-5 days' stay at a hostel, but I realized that this was the adventure of a German truck driver's lifetime.

After the van trip from Fairbanks down to Whitehorse, I encountered the first setback on my journey. I had booked lodging at a hostel there by phone from Fairbanks. The desk clerk said "sorry, we are full and we have no record of your reservation for tonight." So I had to stay in a hotel for one night. Luckily, I met two other independent travellers willing to share the room and the price. Although I managed several hikes, I stayed only three days in Whitehorse, where it rained every day.

The journey to Skagway, in Alaska's panhandle, was also rainy and foggy. After some miles riding bus and train, we dropped below that "fog," which proved to be clouds hugging the steep hillsides facing the Pacific Ocean. In Skagway I found out that the next ferry down to

Prince Rupert in Canada was not scheduled to leave for another two days. Not how I'd have chosen to spend two days, but I had time to rent a bicycle. In the Skagway hostel I met an independent traveller from Germany and another from Switzerland, and we three decided to travel together for a while.

After about a day and a half on the ferry, we arrived in Prince Rupert. In a repeat of the Whitehorse setback, the desk clerk reported, "There is no reservation and no space in the hostel." I was allowed to pitch a tent on the hostel's grounds for a night. It was not comfortable but better than nothing.

We took the next ferry to the Queen Charlotte Islands to hike in the maritime rain forest and maybe to see the "ghost bears" (white-coloured black bears). I had never imagined taking this side trip while planning my itinerary in Germany, but I decided to do it in view of the enthusiasm of my travelling companions.

The only way to the mainland was by ferry back to Prince Rupert. There we had to wait another two days for the next ferry to Port Hardy on Vancouver Island. The trip to Port Hardy featured a number of whale sightings and big ocean waves (admittedly, to a southern German, ocean waves of any size are impressive). A hostel in Port Hardy afforded time to view wildlife and to make decisions for the next portions of my trip.

I took a Greyhound bus down to Campbell River, where another traveller and I decided to rent a car to visit Strathcona Provincial Park, also on Van-

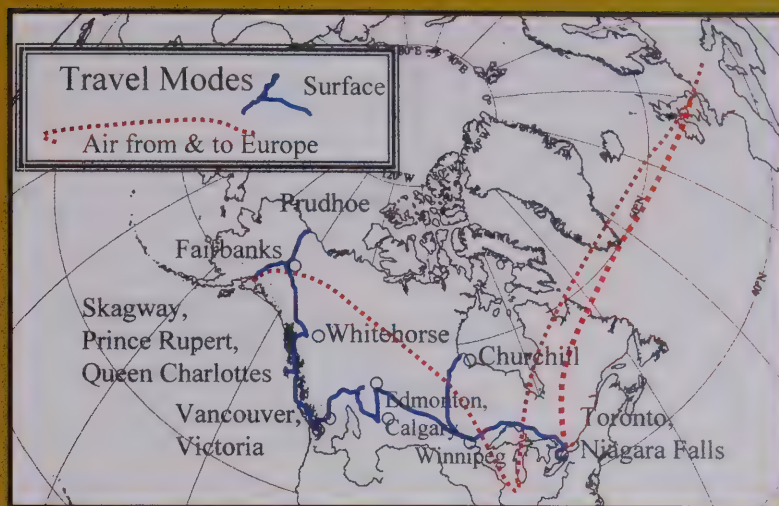
couver Island. There we spent a few days camping and fishing before deciding to visit Cortes Island between Vancouver Island and the mainland. We performed volunteer farm labour for WWOOF (Worldwide Opportunities on Organic Farms) on Cortes Island, in return for free accommodations. It was a really interesting farm without public water, with power from a little turbine, and with primitive toilet facilities. Reluctantly, I left this interesting island because time was passing. My hopes of visiting the Maritime Provinces on Canada's Atlantic coast were already fading.

Back on Vancouver Island, my next challenge was to find the cheapest way to get to British Columbia's capitol city at the southern end of the Island. That evening, I found myself in Victoria after sharing a car ride with two fellow travellers. Victoria will last in my memory as a city of expensive museums, but also featuring interesting free events, such as a parade honouring slain police officers. Also, Victoria is not a typical North American city, but one with a pronounced British culture.

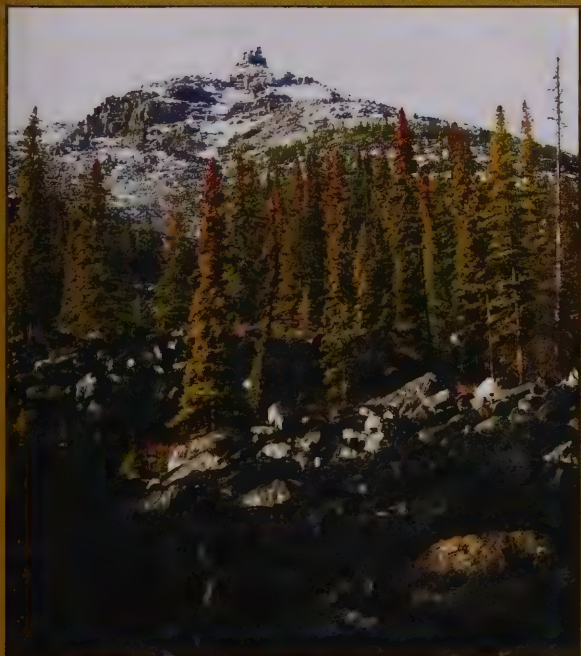
By public bus and ferry, I arrived next in the bustling mainland hub of Vancouver.

There is good access from this enormous metropolis to bears on Grouse Mountain, and other wildlife in Stanley Park. Somehow these natural wonders seemed tame: I saw more wildlife at the other stops on my vacation.

From Vancouver I took *The Canadian*, the famous train route, to Jasper Park on



Map of Württenberger's independent travels in North America, August through November 2007.



Whistler's Mountain in Jasper Park, Alberta, proved too icy to scale.

CONTINUED ON P. 32





Niagara Falls, straddling the U.S.-Canada border, seen in the evening.

the Alberta side of the Rocky Mountains. I tried to hike up Whistler's Mountain. It was impossible because of the ice and snow on the way up to the summit—another reminder that time was passing and winter approaching. By bus I next travelled the "Icefields-Parkway" south to Banff National Park. The driver stopped at all interesting points. From the little town of Banff I hiked a lot, but after a few days I realized that my vacation time was running out.

By Greyhound bus I headed east to Calgary. There, another setback punctuated my journey. The International Youth Hostel told me they were overbooked for the night. Staying one night in a hotel was expensive but comfortable. In Calgary, I was fortunate in being invited to tour several ambulance and fire departments. These visits furnished comparisons to equipment and facilities at home, where one of my jobs is "Rettungsassistent" (paramedic). Back to the Greyhound again, which took me north to Edmonton.

In Edmonton, I rejoined *The Canadian* (using my Canadian Rail pass) to Winnipeg and the evening of the same day I caught another train, *The Hudson Bay*, to Churchill, Manitoba, which is accessible only by train or by air. *The Hudson Bay* was scheduled to arrive at "the polar bear capitol of the world" early the next morning, then to head south again 24 hours later. Because of a 12-hour delay, night had fallen by the time the train pulled into Churchill, and it was now due to leave again the following morning before sunrise. Unless I waited there for the next southward departure of the train three days later, I would not get to see polar bears at all. I quickly decided in favour of

seeing and photographing polar bears, husky dogs and the northern lights, although this cost me extra days, and the B & B was expensive.

The return of *The Hudson Bay* to Winnipeg was again late (15 hours). The delay made me miss rejoining *The Canadian* to Toronto, so I had to stay in

Winnipeg for another three days of my vacation time! This nice little city showed me a lot but my calendar showed that I had only time to go to Toronto and maybe to Niagara Falls and Buffalo. Nova Scotia and Newfoundland would have to wait for another trip.

My final leg on *The Canadian* took me to the biggest city in Canada. After two nights I took another train to Niagara Falls. The famous waterfall between Canada and America was under late autumn weather conditions: cold, rainy and windy but spectacular. The American falls are smaller than the Canadian but also impressive. After two days, I returned by train to Toronto, and after three more days of waiting and walking around the city, I flew across the Atlantic to London, and from there on to Stuttgart. Ironically our landing in Germany was delayed by ice and snow. The snowstorm persisted, so that in two days at home I saw more snow on the ground than I had in three months in Alaska and Canada.

### A Summary of Lasting Impressions:

Alaska and each of the Canadian Provinces that I visited are vast, each one bigger than the whole country of Germany.

- Between my various destinations there were always enormous distances.
- The population densities in Alaska and

Canada are lower than in Germany.

- Not all Canadians and Alaskans drive huge cars.
- Even North Americans are beginning to separate and recycle their garbage.
- Bicycles are slowly gaining popularity in Alaska and Canada.
- Travelling by train is a good way to see a lot but also requires time.
- The landscape and the wildlife in Alaska and Canada are very, very nice.
- Bears, cougars, eagles and so on are not easy to observe: you have to be watchful!
- Lifestyles in North America and Europe are not as different as I once thought.
- In English you can speak with people from all over the world, so you can make a lot of friends.
- Germans' interest in travelling to North America and North Americans' eagerness to visit Europe seem about equal.
- Travelling independently is cheaper than by organized tour. But independence places the burden of making arrangements on the traveller.
- This way of travelling shows you a lot, but is full of unexpected adventures. □



Churchill, Manitoba, "Polar Bear Capital of the World"



# A "Friend" Visits Eagle Island

By Charles H. Lagerbom

Eagle Island is nestled among the Calendar Islands of Casco Bay, Maine, so called since it would take an entire year to visit each island on a daily basis. This 17 acre rocky island is located a few short miles from South Harpswell, and is surrounded on three sides by other bay islands and mainland. Eagle Island also faces the open Atlantic. In the 1870s, the island caught the attention of a young Portland High school student named Robert E. Peary. Within two years of his Bowdoin College graduation in civil engineering, second in his class and Phi Beta Kappa, Peary purchased Eagle Island for \$200 from George Curtis in 1881.

*On a bright, sunny Saturday last July, I had the pleasure of participating in "Trail Day" on Eagle Island, an annual work day run by the Friends of Peary's Eagle Island. They are a volunteer group dedicated to the preservation and protection of Peary's house and island. They work in partnership with the Maine Department of Conservation, Bureau of Parks & Lands. I had come across their website and journal and had signed up to help with their preservation efforts. I was mailed some information about Peary, his island and the Friends organization. Included was a parking pass for the Dolphin Marina in South Harpswell, from which we would depart at 8:30 am sharp. I was so excited, I arrived before 7am and watched the harbor come awake.*

After its purchase, not much was done with the island while Peary spent his time in Nicaragua surveying for an isthmian canal. Even after he had focused his attention on northern Greenland, the island remained relatively untouched. It was not until 1904 that the "Big House" was built on a rocky northeasterly bluff that Peary had long envisioned as the pilot house of a ship. The house was set directly on the ledge and featured a large front porch and two small open back porches. With no kitchen, the Pearys ate at a caretaker's cottage which was located nearby. Both structures had cost Peary \$1500 to build.

*Our "Trail Day" started slow with some boat trouble which delayed our departure. But we kept busy by unloading bags of mulch from pickup trucks and hauling them down the pier onto the dock. We introduced ourselves, including two Assistant State Park Rangers, and waited until a lobster boat arrived to ferry the mulch and us out to the island. Getting pretty adept at moving mulch bags, we were soon loaded and had cast off from the dock for the fifteen minute run out to the island. My first sight of the island with the house prominently displayed on its rocky bluff was very dramatic as it 'suddenly' popped into view as we rounded Haskell Island.*

From 1904 onwards when he was not in the Arctic, Peary and his family spent summers at the island and established trails and gardens

around the site. Several plants were personally brought in by Peary's wife, Josephine, and three island gardens still thrive. The island also sports five different habitats with three beach areas. Since 1979, its southern end of 12 acres has

been classified as a seasonal sanctuary, a major breeding area for ducks, herons, gulls and osprey. In addition to developing the island trails, in 1904 and 1905, Peary added to the big house a kitchen and dining room made from driftwood, but later replaced them with a larger kitchen and dining room in 1911. Between 1910 and 1914, the house was modernized and enlarged including two large bastions, one of which Peary made into his personal library and office. In 1917, Robert E. Peary was diagnosed with pernicious anemia and died February 20, 1920 in Washington, DC. He is buried in Arlington National Cemetery.

*We were met at the dock by Park Manager Jeanie Dorrington, who directed our efforts at unloading the mulch and gear onto the grassy area beside Peary's house. Divided into teams, we made our way along one of the trails known as Dave's Way and worked on parts of the trail that had suffered erosion, especially after the Patriots' Day storm earlier in the spring. We hauled mulch around the island by hand or on a small two-wheeled cart and labored at switchbacks and stone steps, created from the numerous rocks around. The work was steady and satisfying and the views were incredible. It was one of those breathtakingly beautiful sunny days on the ocean and the sea breezes helped cool us as we worked. I could understand Peary's affection for the island.*

The east-side bastion was used as a store room and accumulated many arctic items that Peary had collected over the years. The west bastion became Peary's office and library but by the 1960s had fallen into serious decay and was soon closed. In 1967, the Peary family decided to donate the house and island to the state of Maine, who turned it into a state park. In the 1970s, the Bureau of Parks built a large pier and dock which they have had to rebuild every so often due to severe weather. With limited state resources at its disposal and rising incidents of vandalism, the house and island lingered in limbo. The effects of time and weather on the house took its toll and by the early 1990s, people began to express interest in helping to preserve the site.



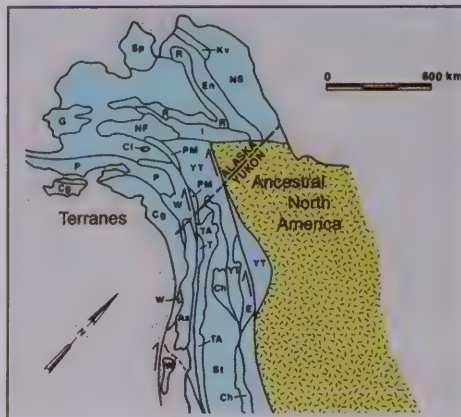
This interest coincided with a restoration project of the library/study west bastion done in 1992 through grants from the state of Maine legislature and the National Geographic Society. It was at this time that the Friends of Peary's Eagle Island was organized. Their goal is to help identify and support the efforts of the Bureau of Parks in maintaining and preserving the big house, the caretaker's cottage and the island's 17 acres of trails, beaches and gardens. The Friends have sponsored two major projects including the establishment of a modern solar-powered composting toilet and the installation of a fire/intrusion alarm system. They also do archival and catalog work, have produced a video regarding Peary and the island, provide guided tours and educational outreach, publish the Eagle Island Journal and arrange volunteer days for house and trail maintenance. Their website is <<http://www.pearyeagleisland.org/default.htm>>.

*The hours flew and by the time we had had lunch and returned to trail work, I was worried that I might not have time to visit the house and library. Luckily for me, our return trip by lobster boat was delayed for an hour so I made my way to the house. It was like stepping back in time. Peary was an expert taxidermist and the house is filled with many of his stuffed birds as well as original bookcases and his desk chair. Many things have been painstakingly restored and/or replaced by the Friends. On the Compass Porch, the house's latitude and longitude are marked over the door and I noticed that Eagle Island is about two miles west of the 70th meridian, the same line of longitude Peary followed in his North Pole quest.*

*I was also impressed by the constant stream of visitors to the island. Jeanie and the two assistant park rangers were kept busy greeting them as were the two Friends acting as docents in the big house. The Friends were great to work with and much was accomplished. I admire their dedication to this historic site and their willingness to help keep it preserved for future generations. Eagle Island, with its polar history connection and its natural beauty, is definitely worth a visit and the Friends of Peary's Eagle Island will be there to welcome you. □*



# BOOK REVIEWS



Generalized map of Canada's and Alaska's terranes. Yellow indicates North American Craton or ancestral terrane. Blue, with coded sections, indicates the complex of displaced accretionary terranes comprising this region. Source: Alaska Park Science 2008, p. 23.

## Alaska Park Science: Connections to natural and cultural resource studies in Alaska's National Parks

Vol. 7, Issue 1, June 2008, 52 pp. Anchorage, Alaska:  
Alaska Geographic and National Park Service,  
Alaska Regional Office. For contents and articles  
published in back issues, go to the free website  
<http://www.nps.gov/akso/AKParkScience/index.htm>

Reviewed by Dave Norton

Once in a great while, a publication commands a reader's immediate and full attention, by combining provocative ideas, images and insights across barriers separating scholarly specialties and by vaulting extents of space and time. Such was a paper copy of the current issue of the semiannual *Alaska Park Science* when it arrived by mail a few days after the June solstice of 2008. The issue consists of seven articles, each summarizing a particular research focus related to Alaska, to Beringia's extent into neighbouring Yukon Territory and Chukotka, and in one case, farther afield, first to Hawaii for comparison with Alaska's volcanic processes, then even beyond the other hemisphere of planet Earth. Upon scanning its contents, I was powerless to resume routines until I had immersed myself in the issue's seminal ideas for half a day.

Romantic poets, semiologists, and educators all how to a two-part recipe: make the strange familiar; make the familiar strange. *Alaska Park Science* joins these guilds by introducing us to unexplored natural territory, then by taking fresh looks at what we think we know about nature.

This issue is noteworthy for the breadth and diversity of its contributions by 18 authors representing 15 different agencies or institutions.

The first article, by Stanley, Caruthers and Blodgett, reconstructs climate change since the Triassic (some 220 million years ago) through the geology, stratigraphy and paleontology of the Wrangell Mountains in the Wrangell-St. Elias National Park and Preserve. Green Butte, towering above McCarthy,

Alaska, yielded some tantalizing marine fossils to these investigators from the University of Montana, University of British Columbia, and the U.S. Geological Survey. The exotic, or displaced terrane known as Wrangellia is one of many small wandering fragments of Earth's crust annealed through plate tectonic processes to the western edge of the North American Craton or shield since the Cambrian beginnings of the Paleozoic Era (see map). The authors trace the steps in their thinking about a jumble of Green Butte's fossils of shallow marine organisms. They guide lay readers like me through the excitement of concluding that diagnostic marine fossils were once wrenched from their reefs by submarine debris flows, as depicted in an interpretive diagram (p. 11). The authors may not have all their theories sorted out, and the geographic origin of the Wrangellia Terrane itself is still a matter of spirited debate. Exposing their steps toward synthesis of nearly a century of geological investigations is nevertheless courageous and entertaining.

People of the Upper Tanana region and their traditional land and resource use are the subject of the second article (pp. 17-21) in this issue. Inhabitants of the Upper Tanana are Athabascans who frequent the northern parts of the Wrangell-St. Elias Park and Preserve, and fall into seven traditional extended families or bands. Their collective network of trails reflects contacts with the more southerly regional cultural group of Ahtna, with whom they traded kinship rights to wildlife and fish resources through the 19th century. In return for rights to harvest salmon from the Copper River, Upper Tanana bands allowed Ahtna residents to hunt caribou near Kechumstuk. The authors (Cellarius, Haynes and Simeone) stress that residents of Northway, Chistochina and Mentasta continue to hunt in Park and Preserve lands (under permits issued by the Park Service) that their forebears used before management of these lands was assumed by Wrangell-St. Elias.

Rohr, Blodgett and Beckstead focus on a small geological anomaly known as the Woodchopper Volcanics, or Terrane, located partly within the Yukon-Charley Rivers National Preserve. Ongoing investigations have turned to marine brachiopod fossils from this Devonian Period, to try to assign the unit some credible geographic origin within accretionary complexes that border the North American Craton at this location (see map).

Two authors, Adler from Clemson University and Currie from the Royal Ontario Museum treat readers to a sharp change of subject in "Barbarians at the Gate: Biting Flies of Beringia" (pp. 28-31). Their investigations of the identities of black flies and mosquitoes across Bering Strait are aimed at correcting a long-standing scientific disconnect between insect taxonomists working in isolated parallel in North America and in the former Soviet Union. Beringia turns out to have been a refugium for the diversity of biting flies, many of which repopulated glaciated areas of the northern hemisphere as the Holocene replaced the Wisconsinan. On the other hand, pest species from lower latitudes in North America have moved north into eastern Beringia, and stand "poised" at the gates to cross the 84-km water gap to western Beringia across Bering Strait. The authors consider this dispersal to become more likely if unidirectional climate change continues.

Co-authors Beget of the University of Alaska and Kargel of the University of Arizona contribute an illustrated article on interactions between volcanic eruptions and permafrost-underlain landscapes in the Bering Land Bridge National Preserve of the northern Seward Peninsula of Alaska. This is something like visiting an altar of modern science, for the maars lakes and the ash fall from volcanic eruptions near Imuruk Lake clinched the debated composition of plant com-

munities in Beringia at the height of the last (Wisconsinan) glaciation, 21,000 years ago, as investigated by—among others—David M. Hopkins, the "Last Giant of Beringia" (O'Neill, 2004). This article relates the unique juxtaposition of lava flows and permafrost on Earth to the only analog known, that of the otherworldly chilly surface of Planet Mars. As most readers are aware, there is mounting evidence from NASA's and other nations' Mars probes, that reservoirs of frozen water ice appear to underlie the surface of Mars, and volcanism and permafrost are likely to have occurred together on the red planet.

Seppelt of the Australian Antarctic Division and Laursen of the University of Alaska provide readers with the most profusely illustrated (44 colour images!) contribution to this issue. "Beneath My Feet: Alaska's Miniature Forests" (pp. 38-45) is a paean to mosses, liverworts, fungi and lichens that play more prominent roles and occupy a greater share of the species diversity of ecosystems and plant communities in the Far North than they do at lower latitudes. Besides showcasing flora constituting these often overlooked small-bodied plants, the Seppelt and Laursen article transcends National Parks in Alaska. Someday bryophytes (mosses) and their "allies" will be treated as megafauna, vascular plants and biting flies have been, across the narrow ribbon of water separating eastern from western Beringia.

The final article included in this issue by Landers, Blett, Erway and Geiser examines how airborne pollutants from near and far reach, then accumulate in, food chains in supposedly protected ecosystems within western North American National Parks. A complex interagency effort known as WACAP (Western Airborne Contaminants Assessment Project) is built around sampling protocols in eight cooperating western national parks or preserves, from southern California to northwestern Alaska. The upshot of this interim report is a mixture of sobering and reassuring news. The planet is "shrinking," so industrial pollutants show up everywhere. On the other hand, most systems and most trophic levels being monitored by WACAP still boast margins of safety between presently observed pollutants and levels that might concern ecologists and toxicologists.

Despite obvious distinctions between APS-membership-supported *The Polar Times* and federal agency-supported Alaska Park Science, there are some noteworthy parallels. Each is interdisciplinary and neither presumes to be peer-reviewed. Each is published twice a year and each covers a similarly ambitious range of topics in comparable space. Because of the physical remoteness of most features and processes addressed by contributors, readers rarely have the time or resources to gain firsthand experience with more than a tiny fraction of topics addressed. By delving into back issues online, readers can assess how the quality and professional appearance of Alaska Park Science have improved since its inaugural issue in 2002. The journal's ability to produce so much colour imagery is enviable. At some point, the National Park Service switched publishing partners, and moved the actual manufacture of paper copies to—you guessed it—China. Occasional typographical errors slip through the Editor and her dozen-member advisory board (an author in this issue is identified as a "curator of entymology" on p. 3). Lapses in layout design compromise the legibility of a few lines of text in this issue (e.g., last full line of last full paragraph, p. 23). Nevertheless, the overall format is reader-friendly and the choice of typefaces generally successful. The vision of *Alaska Park Science's* editorial founders and the topical balance achieved in six-plus years of publishing deserve our salute. □







6 primary editors named, but an additional editorial team of 28 were as a group responsible for organizing the symposium and overseeing peer-reviewing of nearly all the presentations. This book contains a lead chapter of summary and highlights of the symposium, followed by 10 invited Keynote Papers on specific major themes, all of which were peer-reviewed.

The 10th symposium changed to a new format of online and book publication. Presenters, other than keynote speakers, were asked to submit either a short research paper for peer review or an extended abstract without peer review before the symposium. More than 950 co-authors from 34 countries submitted 326 manuscripts. Nearly all papers were published online before the symposium commenced, and the remainder were made available online to meeting participants and authors. All papers are contained in a DVD in the back pocket of the book, and all are also available online at a website established for the symposium. There are 109 Short Research Papers (all peer-reviewed), 217 Extended Abstracts (not peer-reviewed), and 6 Workshop Reports (not peer-reviewed). All papers are listed (by title and authors) in the last few pages of the book as a guide to accessing individual papers on the DVD.

The quality of printing is excellent, with many color illustrations enhancing the text. The book and DVD are valuable references for investigators studying the geology and tectonics of Antarctica and surrounding areas, as well as those who have an interest in the various topics relating to climate change, the potential for rising sea levels, and subjects that indicate that the geology of Antarctica is no longer seen as isolated from the rest of the planet, as noted in the subtitle, "A Keystone in a Changing World." □



## Cold: Sailing to Antarctica

by Thijs Heslenfeld

(Oost West Thijs Best, 2007, 164pp, €34.50)

**Reviewed by Jeff Rubin**

The only way visitors to Antarctica today can experience first-hand the thrilling, queasy, boring and scary moments of sailing a tall ship to the ice is aboard the Dutch three-masted barque Europa.

Built in 1911, Europa sails Antarctic Peninsula and South Georgia waters each year from November to March. While a professional crew of 14 oversees sailing operations, a complement of 48 fare-paying "voyage crewmembers" of all ages sail her, take the wheel, hoist the yards and navigate (see "Canvas and Ice," The Polar Times, July 2005).

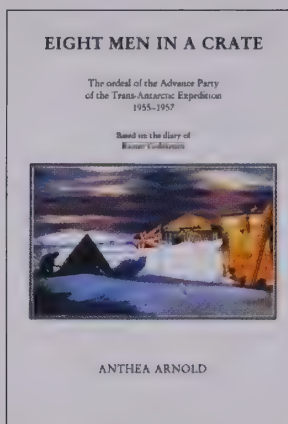
"Sailing the Southern Ocean brings you closer," writes photographer Thijs Heslenfeld in this handsome

book, "to the thin line between life and death. You may feel this during a storm, while climbing the mast or sailing through an iceberg-infested sea during a pitch-dark night."

Dramatic photos—for this is mainly a picture book—describe this even better than words. In one double-page spread photographed on a dark night, figures clad in orange foul-weather gear cling to fixtures as a mighty white wave sweeps the deck. Another photo shows a crewmember leaning over the end of an upper yard, balancing his (her?) feet on the foot-ropes as the huge spread of canvas below powers the ship along. In a wide-angle shot from far out on the end of the bowsprit, a crewmember looks up briefly from furling sail.

In other views, we see Europa's rigging silhouetted against an iceberg, the white of a humpback whale's pectoral fin glowing underwater, a crewman reading in the deckhouse.

With several of captain Klaas Gaastra's logbook entries, Cold gives an enticing view of travelling to Antarctica the way Scott, Shackleton, Amundsen and indeed all visitors did during the Age of Sail. □



## Eight Men in a Crate

by Anthea Arnold

(Erskine Press/Bluntisham Books, 2007, 133pp, £12.75)

**Reviewed by Jeff Rubin**

Subtitled "the Ordeal of the Advance Party of the Trans-Antarctic Expedition 1955-1957," this book is based on the diary of Rainer Goldsmith, physician on the eight-man team. The party was charged with setting up Shackleton Base and laying depots for Vivian Fuchs' half of the Commonwealth Trans-Antarctic Expedition (1955-58), which with Edmund Hillary's support from the New Zealand side of the continent, made the first successful crossing of Antarctica.

An ordeal it was indeed, as the eight men spent a very difficult winter holed up in a Sno-Cat crate and sleeping in tents, trying with inadequate equipment and manpower to construct a poorly-designed base hut.

Fuchs himself, in his 1990 autobiography A Time to Speak, wrote of the nearly-fatal decision to leave supplies offloaded from the expedition's ship Theron on the sea ice: "When the blizzard was over the men found only open water—all their coal and much of their food and fuel had disappeared. As a result our Advance Party spent perhaps the hardest winter endured by anyone since Scott's Northern Party at the beginning of the century."

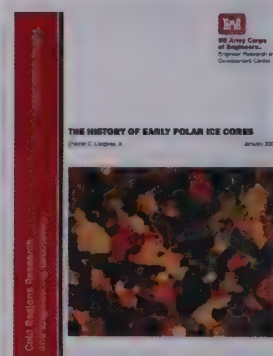
Sadly, it seems that their stoicism was—as is quite often the case—unnecessary. When he visited Britain's scientific station at Halley Bay on the return home from his year at Shackleton Base, Dr. Goldsmith realized that Fuchs was "Classical; the last in a line" beginning with Scott, Amundsen and Shackleton. The hut at Halley Bay was, compared to that of the Advance Party, "an absolute palace" with adequate heat and indoor plumbing.

At Halley Bay, Goldsmith suddenly understood the import of a mysterious comment made by Shackleton Base's only visitors during his year-long sojourn. On 30 December 1956, a helicopter from the ice-breaker USS Staten Island landed near the hut: "Out of it stepped a Martian, wearing a red helmet, a green suit and a yellow life jacket." This was Capt. Edwin A. MacDonald, deputy commander of the U.S. Naval Support Force, Antarctica. The next helo brought Capt. Finne Ronne.

When the eight Britons showed the Americans around their primitive home, so laboriously constructed under such trying conditions, the visitors "looked round in amazement."

All Capt. MacDonald could say, Goldsmith recorded, was, "How quaint, how very quaint."

With 52 excellent photos, 37 in color. □



## The History of Early Polar Ice Cores

by Chester C. Langway, Jr.

(U.S. Army Cold Regions Research and Engineering Laboratory,

Report No. ERDC/CRREL TR-08-1, 2008, 47pp)

**Reviewed by John Splettstoesser**

Ice-core drilling for the recovery of ancient ice is presently conducted for purposes of deciphering past climates and the history of the two major ice sheets in the world as well as numerous ice caps and smaller glaciers. This report is not about the interpretation of recovered ice, but about the history of the technology of drilling, which began more than 50 years ago.

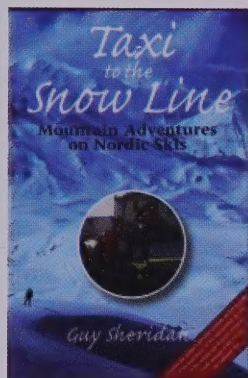
It is best told by the author, who was instrumental in its beginnings and continued for many years, in association with the U.S. Army Corps of Engineers research laboratories known as Snow, Ice and Permafrost Research Establishment, and later, Cold Regions Research and Engineering Laboratory (CRREL).

Deep ice coring in Greenland and Antarctica is discussed in detail, along with the individuals who planned and conducted the work. International partnerships of CRREL with universities in Denmark and Switzerland, starting in 1962, established the foundation of polar ice core science. Deep drilling to date, at



Vostok, Antarctica, has reached nearly 4,000 meters. A table of recovered deep and very deep ice cores from Greenland and Antarctica provides information on locations drilled, years, types of drill, core diameter, and depths; there is also a nine-page reference list.

The report is online at [www.crrel.usace.army.mil/library/cat\\_excavationdrilling.html](http://www.crrel.usace.army.mil/library/cat_excavationdrilling.html) □



## Taxi to the Snow Line

by Guy Sheridan

(White Peak Publishing, 2006, 416pp, £30)

Reviewed by Jeff Rubin

While the majority of this book relates the author's adventures on Nordic skis with two Norwegian friends in a wide assortment of the world's mountains, it includes a historically-valuable and fascinating account of the liberation of South Georgia from Argentine forces during the Falklands War.

Sheridan, then a major in the Royal Marines, com-

manded British land forces on the island in April 1982, and his 40-page 'Letter from Grytviken' is the chief chapter of Antarctic interest.

The confusion and muddle of war runs through the story, beginning with the difficulty caused by the non-alignment of ranks between the Royal Marines, the Royal Navy and the Army. (For this reader, at least, there was also confusion caused by a proliferation of acronyms and British military jargon that lacked explanatory notes.)

Sheridan writes of the difficulties caused by a (perhaps willful) lack of communication shown by the elite SAS forces, whom he calls "shameful" and "arrogant," their performance at South Georgia "ineptitude on a grand scale."

During an ill-advised SAS reconnaissance troop insertion on the Fortuna Glacier, two Wessex helicopters crashed—fortunately, without loss of life—and the wreckage can still be seen today.

Another SAS reconnaissance troop insertion, this time by inflatable craft to Grass Island, was similarly troubled. Three boats' engines failed, and one of the boats was found by a search helicopter the next morning—blown five nautical miles out to sea. Its three occupants were saved from unenviable deaths by the helicopter's winch; their radios had been loaded into another boat.

Following these cock-ups, and a subsequent loss of covertness for the entire operation, the threat of an Argentine submarine forced a delay in land operations. Once the Argentine sub Santa Fe was located and damaged by depth charges, Sheridan and his men were cleared for their land assault.

In the end, the attack was somewhat anti-climatic.

Under cover of 235 4.5-in shells fired by HMS Antrim and HMS Plymouth, British forces retook the base at King Edward Point without difficulty. The Argentines were flying several white flags of surrender, their marines and sailors sat on the beach singing and chanting, and they fired not a single shot. (In the advance on KEP, several SAS men did open fire on a group of elephant seals, killing several.)

An interesting black-and-white illustration reproduces the single-page typewritten surrender document signed by the Argentine commanders, along with Sheridan and the commander of the British task group.

In the weeks following the surrender and removal of 137 Argentine POWs, Sheridan made a reconnaissance of several South Georgia harbors to write a paper on the island's defense. During the course of that work, he recalls, night-vision telescopes were useful for watching the nightly scurrings of South Georgia's myriads of rats.

Sheridan's men also uncovered a vast trove of wine left at Leith by the Argentine scrap merchants who set off the war; the bottles were so numerous that they supplied Endurance's mess for "a couple of years!"

This detailed account of the war at South Georgia makes fascinating reading and is alone worth the price of the book. Another chapter, 'Storms in South Georgia,' describes his attempt to climb Sheridan Peak (named for him) during the winter of 1999.

With 152 color photos (26 of South Georgia), and 14 full-color maps.

To order, email the author at [<guy.sheridan@yahoo.co.uk>](mailto:guy.sheridan@yahoo.co.uk) □

## Obituaries

### Sir Edmund Hillary

**By Adam Bernstein, Washington Post, 11 January 2008**—Sir Edmund Hillary, the New Zealand beekeeper-turned-mountaineer who with his Sherpa guide in 1953 became the first known men to conquer Mount Everest, the world's tallest peak, died early today at Auckland City Hospital. He was 88. No cause of death was reported.

Hillary was a notoriously aggressive and competitive adventurer. That trait emerged more conclusively when he united in the mid-1950s with British explorer Vivian Fuchs to travel more than 2,100 miles across Antarctica, from the Weddell Sea coast in the north to McMurdo Sound in the southwest.

The expedition, part of the IGY, would complete what Ernest Shackleton couldn't in the early 1900s: crossing the continent via the South Pole.

Hillary's chief task was to arrange supply depots for the Fuchs team, but he chafed at this subservient role as well as what he characterized as Fuchs' conservative leadership and lack of momentum.

When Hillary realized his last supply base was only 400 miles from the pole, he unilaterally decided to reach the pole with his small team despite bad weather and unstable snow bridges. He navigated through to the pole Jan. 4, 1958, more than two weeks ahead of Fuchs.

Hillary became the first explorer to reach the pole by land in 46 years.

He then sent a radio transmission to London recommending that because of poor weather conditions, Fuchs should turn back and let him — Hillary — cross the rest of the continent. Fuchs refused to

do so, and the two men proceeded together to McMurdo Sound and arrived early that March. Fuchs, who was knighted for his work, told an interviewer in 1990: "I have never blamed him for what he did. It would have been like turning back from the south summit of Everest."

His most shattering experience was the loss of his wife, Louise Rose Hillary, and their teenage daughter, Belinda, in a plane crash near Kathmandu, Nepal, in 1975. They were flying to meet Hillary at a Nepalese outpost called Paphlu, where he was helping build a hospital.

In 1989, he married June Mulgrew, the widow of Hillary's climbing partner, Peter Mulgrew, who had died in a plane crash in Antarctica's Mount Erebus a decade earlier. Hillary was also supposed to have been on the flight but canceled at the last minute.

Unlike many climbers, Hillary said that when he died he had no desire to have his remains left on a mountain. He wanted his ashes scattered on Waitemata Harbor in the northern city of Auckland where he lived his life.

Besides his second wife, survivors include two children from his first marriage, Peter, who has also climbed Everest, and Sarah. [The Associated Press contributed to this report.]

### Rudolf Aarne Honkala

**Concord (N.H.) Monitor, 21 May 2008**—Rudolf A. Honkala, 84, died 16 May 2008 at his home in Bethel surrounded by family. He graduated from the University of New Hampshire in 1946 with a B.A. in Art and later earned his M.A. in geography from the University of Montana.

After college, Rudi worked for the Mt. Washington Cog Railway, The Kearsarge Telephone Company

and was on staff at the Mt. Washington Observatory for 4 years during the 40s. (He returned as Chief Observer in 1955-56.) He met his bride-to-be, Barbara Hastings, on Mt. Washington, and they were married in February 1950. Rudi and Barb then served for two years as husband-and-wife weather observers at remote Alaskan stations for the U.S. Weather Bureau. Their first son was born in Nome in 1951.

Rudi participated in IGY and went three more times to the Antarctic, once as Chief Weather Observer with the Australians at Wilkes Station (now Casey) 1959-61, and again as Scientist-in-Charge at Palmer Station, 1966-68.

Rudi has an Antarctic island named after him; is holder of the Congressional Antarctic Medal and the Australian Antarctic Medal. He was a member of the Explorer's Club, the Antarctic Society and has journals and photographs in the Polar Section of the National Archives.

He is survived by his wife of 58 years, Barbara Hastings Honkala, and four children.

### David C Nutt

**By David C Nutt, Jr**—Captain David C. Nutt, a Governor of the American Polar Society, died 10 January 2008 in Hanover, NH. He was 88.

He graduated from Dartmouth College with a degree in Botany in 1941. In 1943 he married Babs Wright and they moved to Etna, NH in 1946.

From 1935 until 1940 David accompanied Captain "Bob" Bartlett to Greenland on the schooner *Morrissey* serving as a seaman, a navigator and a curator for the Smithsonian. Upon graduating from Dartmouth College he served until 1943 as Executive

CONTINUED ON P. 38



Officer on the schooner *USS Bowdoin* in Greenland under Captain Donald MacMillan. He then served as Exec and Commanding Officer on the *USS Sumner*, a Navy survey ship, and was involved in operations at Ulithi (harboring 400 fighting ships classed destroyer and above), Guam, Iwo Jima, Leyte, Okinawa, Korea, China, and Bikini. At Iwo Jima, Nutt went ashore, climbed Mt. Suribachi, and found his old college roommate, Marine Captain Robert White, in a foxhole "while Hell's kitchen was flying overhead."

After the war he pursued a career in the Arctic. In 1948 he acquired the 100-ft schooner *Blue Dolphin*, which he based in Boothbay Harbor, Maine. She was refitted for Arctic oceanographic research and from 1949 to 1954 surveyed the fjords and estuaries of Labrador. This research resulted in a vital baseline for the thermal and compositional history of subarctic estuaries which contained cold Arctic bottom waters. To complete the annual cycle of observations, Nutt and his crews made winter observations in March through the ice with the support of dog teams and sledges. They made late fall observations from small boats during freeze-up. He later did research on the Greenland icecap and developed methods to determine the atmospheric conditions at the time the ice was formed. During these years of research he was associated with and taught courses at Dartmouth College.

He was an Honorary member of the American Polar Society and was an Officer and later Chairman of the Arctic Institute of North America.

Survivors include six children; 12 grandchildren and 6 great-grand children.

### Gerald Frank Webers

**By John Spletstoesser**—Gerald F. Webers, age 75, passed away at his home in Roseville, Minnesota, on 14 February 2008 after a series of complications associated with cancer. He taught geology for 32 years at Macalester College and traveled to Antarctica 19 times, four as a graduate student from 1960-1965, and one as leader of his own expedition in 1979-80 when a professor at Macalester.

His specialty as paleontologist led to major discoveries in the latter season that resulted in new genera and species of invertebrates from the early Paleozoic, as well as connections of Ellsworth fauna with other land masses that once comprised Gondwanaland. He also participated as a lecturer-naturalist on 14 cruises to Antarctica on tour vessels.

"Webers Peaks" in the Ellsworth Mountains are named for him, as are several fossils. He published widely, including 2 books and numerous papers in scientific journals. He was awarded the U.S. Antarctica Service Medal, and the "Distinguished Achievement Award" from Lawrence University, Appleton, Wisconsin, where he received his B.S. degree in Geology. He is survived by his wife of 49 years, Kathleen, daughter Julie, two grandchildren, three brothers and a sister.

### Robert Baden Thomson

**Roanoke Times**—Robert B. Thomson, 80, of Moneta, died 3 January 2008, at his residence. He was a retired Director of the New Zealand Antarctic Division.

Bob began his long Antarctic career as an IGY radio operator and electronics technician on Campbell Island. When he applied to be an upper atmosphere physicist at jointly-run (US-NZ) Hallett Station, he was appointed scientific leader in 1960, followed by a summer as leader at Scott Base, and again in 1963 and 1964. He wintered over in 1962 as scientific leader of the Australian station Wilkes.

He led a 900-mile over-snow expedition from Wilkes to Vostok and back. Navigating by sunshots plotted on graph paper, he arrived precisely on target without mishap, experiencing some of the cold-

est temperatures that man has ever known. For that accomplishment, in June 1964, Bob was granted the Dignity of an Ordinary Officer of the Civil Division of the Order of the British Empire by Queen Elizabeth II.

Bob was the Director of New Zealand's Antarctic Research Program from 1965 to 1988. In 1968, he established Vanda Station in the Dry Valleys. During that time, he was a delegate to every international Antarctic Treaty meeting and in alternate years to the Scientific Committee on Antarctic Research (SCAR), serving as secretary chairman of the logistics-working group.

He made 78 trips to Antarctica. Bob received numerous honors for his work, including the U.S. Antarctic Service Medal; the Order of the Sacred Treasure, Gold Rays conferred by his Imperial Majesty the Emperor of Japan; and the Antarctic Service Medallion for service with the Australian National Antarctic Research Expeditions.

Bob is survived by his wife of 37 years, Betty I. Thomson; four children; one sister; and six grandchildren.

### Geza T. Thuronyi

**By Joe Holley, Washington Post, 4 January 2008**—Geza T. Thuronyi, a retired bibliographer who headed a Library of Congress project that gathered scientific information on the world's cold regions, died 31 December 2007 at Fox Chase nursing home in Silver Spring. He was 88.

A Hungarian immigrant who spoke French, German, English, Hungarian and Russian, Thuronyi supervised a six-person staff that introduced computer technology into the preparation of two continuing bibliographies, *Antarctic Bibliography* and *Bibliography on Cold Regions Science and Technology*. In 1988, a high, steep bank on the Antarctic Peninsula was officially named Thuronyi Bluff in his honor.

Mr. Thuronyi was born in 1919 in Klatova Nova Ves, in what was then Czechoslovakia, into an aristocratic Hungarian family. He received a law degree from Pazmany University in Budapest in 1941 and shortly thereafter was drafted into the Hungarian army.

After the war, the communist takeover of Hungary made him a refugee. His family lost all its property, and relatives immigrated to several countries. Mr. Thuronyi arrived in the United States in 1950 and never returned to Hungary.

Because his Hungarian law degree was not recognized in the United States, he could not practice law, so he became a door-to-door Fuller Brush salesman. He hated the job and walked away after a week. Capitalizing on his language skills and scholarly bent, he became a bibliographer.

Survivors include his wife of 53 years, Helen "Lilly" Thuronyi of Silver Spring; four sons; a brother and sister; and two grandsons.

### Fritz Koerner

**Telegraph, 29 May 2008**—Fritz Koerner, who died on May 26 aged 75, was a greatly respected glaciologist and polar explorer and one of only a handful of people to be awarded the Polar Medal with both Arctic and Antarctic clasps.

On May 29 1969 Koerner and a companion made a touch-and-go landing on Vesle Tavleøya, a small rocky island off the north coast of Svalbard. This marked the climax of the successful bid by Wally Herbert's Trans-Arctic Expedition to make the first surface crossing of the Arctic Ocean.

The four-man expedition had left Point Barrow, Alaska, on February 21 1968 with four dog teams, and by the end of the journey had covered 3,620 route miles over the sea ice. They had spent periods of encampment on the ice during mid-summer and mid-winter, when Koerner had made detailed studies of ice structure and topog-

raphy, in conjunction with meteorological observations.

They had reached the North Pole on April 5 1969 and then, assisted by the drift of the ice, had made good time to Svalbard. The success of the expedition had been made possible through periodic air drops of supplies by Royal Canadian Air Force Hercules aircraft.

Roy Martindale Koerner, known as Fritz, was educated at Portsmouth Southern Grammar School and Sheffield University, where he read Geography, graduating in 1954.

In 1957 he joined the Falkland Islands Dependencies Survey (now the British Antarctic Survey) and spent the next two and a half years as senior meteorologist and glaciologist at the Survey's Hope Bay station, near the northern tip of the Antarctic Peninsula. It was when he arrived there that he first met Wally Herbert, who was about to return to Britain.

Koerner's duties kept him mainly at the Hope Bay base, but he took part in several short journeys by dog sledge. For his work here he received the Polar Medal in 1963, and the 2,000ft high Koerner Rock, near Hope Bay, was named for him.

In 1961 Koerner was engaged, as a glaciologist, to join the expedition to Devon Island, Canadian Northwest Territories, organised by the Arctic Institute of North America in Montreal. He spent that summer and the following winter and summer working on the ice cap that covers most of the eastern half of Devon Island.

His main interest was now in snow stratigraphy, the analysis of which is needed to provide estimates of glacial mass balance and of seasonal variations of temperature, particularly in regard to the presence or absence of ice layers. Koerner's work on the ice cap in 1961-62, and further work in the summers of 1963, 1965 and 1966, earned him a PhD from the London School of Economics, and laid the foundation for his later, important research elsewhere in the Canadian Arctic.

Meanwhile, in 1963 Koerner had joined the Geography department of Ohio State University as a research associate. In 1966-67 he was a member of the Ohio team that spent the Antarctic summer season at the U.S. Plateau Station at an altitude of nearly 12,000ft, and established entirely by air early in 1966. Here too he concentrated on the analysis of snow stratigraphy; and for his work he later received the U.S. Antarctic Service Medal.

Following his crossing of the Arctic Ocean (for which, in 1969, he received a second clasp to his Polar Medal), Koerner joined the department of Energy, Mines and Resources in Ottawa as a research scientist and as head of the Ice Core Laboratory. The department had acquired the equipment needed for the deep drilling of ice cores, and it was in ice-core analysis that Koerner carried out his most important work.

He and his colleagues extracted surface-to-bed-rock cores from the Agassiz ice cap on Ellesmere Island. By observation of the occurrence of dense ice layers and by analysis of temperature-dependent oxygen isotope ratios in seasonal strata, they demonstrated that the warmest summers occurred 10,000 years ago and the coldest only 150 years ago; and that the summers over the past 100 years had been the warmest for more than 1,000 years. They concluded that their results were of wide regional significance, and in general agreement with the results from similar work in central Greenland.

During his time in Ottawa Koerner held the position of Adjunct Professor of Geography at Carleton University; and over the course of his career he published more than 70 scientific papers, mainly in the field of glaciology.

His Polish wife, Anna, whom he married in 1964, died in 1980; they had a son and three daughters. □



# Membership News

Summer greetings from the coast of Maine! We survived one of the snowier winters on record and now are seeing trees come to life, days becoming bright and sunny, and tourists appearing in greater numbers along Route 1.

The mailing of the January issue of *The Polar Times* was successful, although a few were returned to the APS Membership Center. Please keep us informed of new addresses. We were also notified that a few members had difficulty receiving their copies. The APS is constantly working to make sure addresses are correct and valid. We really appreciate the members who keep us up-to-date with their changing information, saving us significant postage costs. Thank you!

In accordance with the drive to keep society costs down, the Membership Center will attempt to notify members of their renewals this coming October by email. We will do this as much as possible and will send renewal notices by mail to those we do not reach electronically. The Membership Center will chart the responses and evaluate this attempt at lowering postage costs for the society. So if you have a new email address or it has changed or if you are not sure we have the correct one, please contact us at the Membership Center. Rest assured that regular mail efforts will continue to those who do not have email or have not shared their email addresses with us. If

you have any questions, comments or concerns please contact us at the APS Membership Center.

My family and I have just finished construction of a new home in Northport, Maine and so the society's email address will be changing sometime over the summer. We should be all settled and arranged before the fall attempt at email renewals. Please note: APS Membership Center's regular mail address will continue to remain the same:

American Polar Society, PO Box 300, Searsport, Maine 04974.

The APS has seen a decent influx of new members in the first half of 2008. Sending someone an APS membership would make a great Christmas gift. Please refer to the Business Reply Card insert in the latest issue. As always, if you have a friend, colleague or someone who might be interested in the APS and *The Polar Times*, please contact the Membership Center and we will send a complimentary issue to them with membership information.

I consider it a privilege to serve as your Membership Chair and want to thank you for all your help and support. □

**Charles H. Lagerbom**  
**Membership Chair, APS**  
**APS Membership Center**  
**PO Box 300 Searsport, ME 04974**  
**ampolars@prexar.com**

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## About Our Back Cover

*It's a bird! It's a plane! No wait, it is a bird! A rare, one-in-a-million bird to be specific. Meet Snowdrop, an albino African penguin, hatched alongside a regular black-and-white sibling at a zoo in Bristol, Great Britain, in November, 2002. He is the first albino African penguin to have been born in captivity and was hand-reared by Nigel Simpson (shown here at mealtime with his charges). Albinism is a simple mutation resulting from recessive genes carried by both parents who may look perfectly normal and, in Snowdrop's case, is the reason for his all-white plumage, pink feet, pale beak and red eyes. Duncan Bolton, curator at Bristol Zoo Gardens, stated that there have been only two recorded sightings of albino penguins in the wild. African penguins live in a small area around the coasts of South Africa. □*

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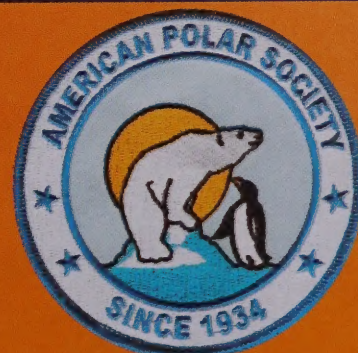
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"Snowdrop" · Photo: Adrian Pingstone, August 2003